حمل الآن

مجانا وحصريا

امتحانات رقم (1)







1 Cairo Governorate



Misr El-Gadida Zone
Mathematics Supervision

First Multiple choice questions



Choose the correct answer from those given :

(1) If $f : [-3, 5] \longrightarrow \mathbb{R}$, $f(x) = \frac{1+x}{x+4}$, then the domain of f is ....

(a) $\mathbb{R} - \{-4\}$ (b) $\mathbb{R}^+$ (c) $\mathbb{R} -]-3, 5[$ (d) $[-3, 5]$

(2) If $f(x) = x^2 + 6$, $g(x) = 3x$, then $(f \circ g)(3) =$ ....

(a) 75 (b) 87 (c) 125 (d) 45

(3) The function $f(x) = x \tan x$ is ....

(a) even. (b) odd.

(c) one-to-one. (d) neither even nor odd.

(4) $\lim\limits_{x \to 3} \frac{\sqrt{x+1} - 2}{x - 3} =$ .... cm.

(a) zero (b) $\frac{1}{4}$ (c) $\frac{1}{2}$ (d) 1

(5) In Δ ABC If a = b, then cos (B + C) = ...

(a) $\frac{2b^2}{c}$ (b) $\frac{-c}{2b}$ (c) $\frac{c}{4a}$ (d) $\frac{b}{2a}$

(6) If $\lim\limits_{x \to 2} \frac{x^2 - k}{x - 2} = 4$, then k = ...

(a) 4 (b) 2 (c) 1 (d) 8

(7) $\frac{\log 49}{\log 7} =$ ....

(a) log 7 (b) log 2 (c) 2 (d) 7

(8) The solution set of the inequality : $|x + 3| \leq 0$ is ....

(a) $\varnothing$ (b) $]-\infty, 3]$ (c) $]-3, \infty[$ (d) $\{-3\}$

(9) Point of symmetry of the function $f(x) = \frac{1}{x+3} + 2$ is ....

(a) (3, −2) (b) (−3, −2) (c) (3, 2) (d) (−3, 2)

(10) In Δ XYZ, if $\frac{z}{\sin Z} = 10$, then $\frac{x}{\sin X} + \frac{y}{\sin Y} =$ ....

(a) 10 (b) 20 (c) 60 (d) 90

(11) $\lim\limits_{x \to 2} \frac{x^5 - 32}{x - 2} =$ ....

(a) 70 (b) 80 (c) 60 (d) 50

(12) If the length of the radius of the circumcircle of the triangle ABC , is 6 cm.

, then $\frac{2c}{\sin C}$ = ... cm.

(a) 12 (b) 8 (c) 4 (d) 24

(13) $\lim_{x \to \infty} \frac{2x^2+1}{x^2+1}$ = ...

(a) 0 (b) doesn't exist (c) ∞ (d) 2

(14) The solution set of the equation : $4^{x+2} = x^{x+2}$ is ....

(a) $\{-4, 4, 2\}$ (b) $\{-2\}$ (c) $\{-4, 4, -2\}$ (d) $\{4, -2, 2\}$

(15) If $f(x) = 2x$, then the domain of $f^{-1}(x)$ is ....

(a) $\mathbb{R}$ (b) $\mathbb{R} - \{2\}$ (c) $[-2, 2]$ (d) $\mathbb{R} - \{\frac{1}{2}\}$

(16) Measure of the greatest angle of a triangle of side lengths 3 cm. , 5 cm. , 7 cm.

is ....°

(a) 150 (b) 60 (c) 120 (d) 30

(17) Number of solutions of the triangle ABC , in which m (∠ C) = 115° , c = 7 cm.

, b = 4 cm. is ....

(a) zero (b) 1 (c) 2 (d) infinite number.

(18) $f(x) = 2^{x+3}$, then $f(-3)$ = ...

(a) zero (b) 1 (c) $\frac{1}{2}$ (d) $\frac{1}{8}$

(19) $\lim_{x \to 0} \frac{\sin^2 3x + x^2}{x^2}$ = ...

(a) 10 (b) 4 (c) 9 (d) 3

(20) $\lim_{x \to 0} \frac{1 - \cos x}{3x}$ = ...

(a) zero (b) 1 (c) $\frac{1}{3}$ (d) doesn't exist.

(21) The solution set of the equation : $2^{x+1} + 2^{x} = 12$ is ....

(a) $\{3\}$ (b) $\{3, 2\}$ (c) $\{-3\}$ (d) $\{2\}$

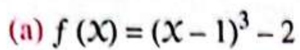
(22) $\log_a x = y$ is equivalent to ....

(a) $\log_a y = x$ (b) $a^y = x$ (c) $a^x = y$ (d) $y = ax$

(23) $\lim_{x \to 4} \frac{x^2 - 24}{x - 4}$ = ...

(a) 96 (b) 48 (c) 32 (d) undefined.

(24) Which of the following rules represents the curve in the given figure ....

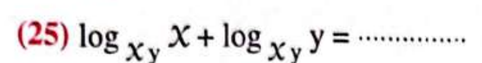


(a) $f(X) = (X-1)^3 - 2$

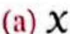
(b) $f(X) = 2 - (X-1)^3$

(c) $f(X) = (X+1)^3 - 2$

(d) $f(X) = -(X-1)^3 - 2$



(25) $\log_{Xy} X + \log_{Xy} y =$ ....



(a) X (b) y (c) Xy (d) 1

(26) If $f(X) = \begin{cases} aX^2 - 3 , & X \neq 2 \\ 2a , & X = 2 \end{cases}$ is continuous at $X = 2$, then a = ...

(a) $\frac{1}{2}$ (b) $\frac{2}{3}$ (c) $\frac{3}{2}$ (d) 6

(27) $\log \cos \theta + \log \sec \theta =$ .... where $\theta \in]0 , \frac{\pi}{2}[$

(a) 1 (b) zero (c) 2 (d) – 1

Second | Essay questions

Answer the following questions :

1 Graph the curve of the function $f(X) = |X - 2| + 3$ and from the graph determine the domain , the range , discuss the monotony and show if the function is even , odd or otherwise.

2 Find : $\lim_{X \to \infty} \frac{3X^{-3} - 5X^{-1} + 1}{7 + 4X^{-1} + 5X^{-2}}$

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First | Multiple choice questions



Interactive test 2

Choose the correct answer from those given :

(1) The domain of the function $f(X) = \sqrt{X-2} + \sqrt{5-X}$ equal to ....

(a) $[5 , \infty[$ (b) $]-\infty , 2]$ (c) $[2 , 5]$ (d) $\mathbb{R}$

(2) All functions defined by the following rules are not one-to-one except ....

(a) $f(X) = X^2$ (b) $f(X) = 5$ (c) $f(X) = X + 2$ (d) $f(X) = \sin X$

(3) If $f(X)$ is an odd function , then $\frac{3f(X) + 9f(-X)}{2f(X)} =$ .... where $f(X) \neq$ zero

(a) zero (b) – 3 (c) – 4 (d) 4

(4) $f(x) = 2x + 1$ and $g(x) = 3x - 4$, $2 \in$ the domain of $(f \circ g)$
, then $(f \circ g)(2) = \dots\dots$

(a) 2 (b) 3 (c) 4 (d) 5

(5) The solution set of the equation $|2x + 4| = 1 - x$ is $\dots\dots$

(a) $\{-1, -5\}$ (b) $\{1, -5\}$ (c) $\{1, 5\}$ (d) $\{-1, 5\}$

(6) The solution set of the inequality $\left|\frac{x-3}{4}\right| \leq 1$, is $\dots\dots$

(a) $\mathbb{R} -]-1, 7[$ (b) $[-1, 7]$ (c) $]-1, 7[$ (d) $\mathbb{R} - [-1, 7]$

(7) The inverse function of the function $f(x) = \sqrt{x-2}$, $x \geq 2$ is $f^{-1}(x) = \dots\dots$, $x \geq 0$

(a) $x^2 - 2$ (b) $x^2 + 2$ (c) $x^2 + 1$ (d) $x + 1$

(8) If $f(x) = 5^x$, then $\frac{f(x+3) + f(x+1)}{f(x+2)} = \dots\dots$

(a) 5.2 (b) 20.2 (c) 25 (d) 30

(9) The solution set of the equation : $(3x + 2)^{\frac{3}{4}} = 8$ is $\dots\dots$

(a) $\frac{15}{2}$ (b) $\frac{14}{3}$ (c) $\frac{17}{2}$ (d) 6

(10) If $3^x = 5$, then $x = \dots\dots$ approximately.

(a) 1.46 (b) 1.64 (c) 0.6 (d) 0.62

(11) The solution set of the equation : $25^x - 20 \times 5^x - 125 = 0$ is $\dots\dots$

(a) $\{1\}$ (b) $\{2\}$ (c) $\{3\}$ (d) $\{4\}$

(12) The solution set of the equation $\log_x 5x = 2$ is $\dots\dots$

(a) $\{0, 5\}$ (b) $\{0\}$ (c) $\{5\}$ (d) $\{2\}$

(13) If $\log_2 x = \log_{27} 27$, then $x = \dots\dots$

(a) 8 (b) 4 (c) 3 (d) 2

(14) $\lim_{x \to 2} \frac{x^4 - 16}{x^3 + 8} = \dots\dots$

(a) 0 (b) 1 (c) 2 (d) 3

(15) If $\lim_{x \to 2} \frac{x^2 - 4a}{x - 2}$ is exist, then $a = \dots\dots$

(a) 4 (b) 1 (c) -4 (d) -1

(16) If $\lim_{x \to \infty} \frac{a x^3 - 5x^2 - 1}{2x^b + 8x + 9} = 3$, then $a + b = \dots\dots$

(a) 6 (b) 9 (c) 3 (d) 1

(17) $\lim_{h \to 0} \frac{(x+h)^7 - x^7}{h} = \dots\dots$

(a) zero (b) $7x^6$ (c) $7x^7$ (d) x^7

(18) $\lim_{x \to 0} \frac{\sin^2 3x + \tan 5x^2}{x^2 \cos 5x - 3\sin^2 x} =$ ....

(a) 3 (b) – 5 (c) 8 (d) – 7

(19) $\lim_{x \to 3} \frac{x^2 - 9}{\sqrt{x-2} - 1} =$ ....

(a) zero (b) 5 (c) 7 (d) 12

(20) $\lim_{x \to \infty} \frac{4x^{-5} - 3x^{-2} + 8}{3x^{-5} - 3x^{-3} + 2} =$ ....

(a) 2 (b) 4 (c) 6 (d) 8

(21) $\lim_{x \to \infty} \frac{\tan \frac{8}{x}}{\frac{2}{x}} =$ ....

(a) 16 (b) 8 (c) 4 (d) – 4

(22) In triangle XYZ , if 2 sin X : 4 sin Y : 3 sin Z , then $x : y : z =$ ....

(a) 2 : 3 : 4 (b) 4 : 2 : 3 (c) 3 : 4 : 6 (d) 6 : 3 : 4

(23) The length of a side in a triangle is equal to 6 cm. and the measure of the angle opposite to this side is 60° , then the area of circumcircle of this triangle = ... cm^2.

(a) 3π (b) 6π (c) 9π (d) 12π

(24) Δ ABC in which a = 8 cm. , b = 5 cm. and the angle between them is 30° , then the area of Δ ABC = ... cm^2.

(a) 10 (b) 20 (c) 30 (d) 40

(25) Δ ABC if , m ($\angle$ B) = 76° , c = 12 cm. , a = 10 cm. , then b $\simeq$ .... cm.

(a) 12.6 (b) 13.6 (c) 14.6 (d) 15.6

(26) The measure of the largest angle in Δ ABC in which a = 14 cm. , b = 15 cm. , c = 17 cm. equals .... to the nearest degree.

(a) 72 (b) 56 (c) 40 (d) 30

(27) In Δ ABC : a (b cos C + c cos B) = ...

(a) a^2 (b) b^2 (c) c^2 (d) $2b^2$

Second Essay questions

Answer the following questions :

1 Draw the curve of the function $f(x) = x^2 - 4x + 4$, showing the domain of the function and , then determine the range of the function

2 If the function $f(x) = \begin{cases} a x^2 + 5 & , x \le 2 \\ 9 - b x^2 & , x > 2 \end{cases}$ is continuous at $x = 2$

Find the value of : a + b

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Mathematics Supervision

First Multiple choice questions



Interactive test (3)

Choose the correct answer from those given :

(1) If $\left(\frac{1}{2}\right)^{a^2 - a - 2} = 1 : a > 0$, then a = ...

(a) 1 (b) -3 (c) 2 (d) 3

(2) If $f(x) = |x - 2| + 4$, then the solution set of the equation $f(x + 2) = 6$ is ....

(a) $\{1 , 3\}$ (b) $\varnothing$ (c) $\mathbb{R}$ (d) $\{-2 , 2\}$

(3) In Δ ABC , if m ($\angle$ A) = 30° , c = $15\sqrt{3}$ cm. , m ($\angle$ C) = 60° , then a = ... cm.

(a) 30 (b) 45 (c) 15 (d) 60

(4) If $f(x) = \begin{cases} a + \cos x & , \quad x < 0 \\ \frac{\tan 2x}{a x} & , \quad 0 < x < \frac{\pi}{4} \end{cases}$, and $\lim\limits_{x \to 0} f(x)$ exists , then a = ...

(a) 0 or 1 (b) 1 or -2 (c) 2 or 3 (d) 1 or 3

(5) If $y = \sqrt[3]{x}$, then its inverse function is y = ...

(a) $\frac{1}{3} x^3$ (b) x^3 (c) $x^3 - 1$ (d) $3 x^2$

(6) $\lim\limits_{x \to 0} \frac{\tan^2 2x}{x \sin 3x}$ = ...

(a) $\frac{1}{6}$ (b) $\frac{3}{8}$ (c) $\frac{1}{2}$ (d) $\frac{4}{3}$

(7) The one-to-one function from those defined by the following rules is ....

(a) $f(x) = 3 - x^2$ (b) $f(x) = x^3 + 3$

(c) $f(x) = \sin x \tan x$ (d) $f(x) = x^2 + x$

(8) The curve of the function $f : f(x) = 5^x$ intersects the y-axis at the point ....

(a) (1 , 0) (b) (0 , 1) (c) (5 , 1) (d) (1 , 5)

(9) A circle with diameter length 20 cm. , passes through the vertices of Δ ABC , which is an acute-angled triangle in which BC = 10 cm. , then m ($\angle$ A) = ...°

(a) 30 (b) 60 (c) 45 (d) 150

(10) If $f(x) = 5x + 4$, $g(x) = 2 - x$, then $(f \circ g)(-2) + (g \circ f)(5) =$ ....

(a) 24 (b) -27 (c) 49 (d) -3

(11) ABCD is a parallelogram in which AB = 8 cm. , BC = 11 cm. , BD = 9 cm.
, then the length of $\overline{AC} \approx$ .... cm.

(a) 9 (b) 10 (c) 17 (d) 11

(12) $\lim\limits_{x \to \infty} \frac{x^7 - 2x^3}{2x^4 - 3x^2 - 1} =$ ....

(a) 0 (b) 3 (c) ∞ (d) $\frac{1}{2}$

(13) If $\log_3 (4 + \log_2 x) = 2$, then $x =$ ....

(a) 16 (b) 32 (c) 64 (d) 128

(14) $\lim\limits_{x \to 3} \frac{\sqrt{x+1} - 2}{x - 3} =$ ....

(a) 4 (b) $\frac{1}{4}$ (c) 6 (d) $\frac{1}{6}$

(15) The solution set of the inequality : $|3x + 2| + 5 \le 4$ in $\mathbb{R}$ is ....

(a) $[-3 , \frac{2}{3}]$ (b) $\mathbb{R} -]-3 , \frac{2}{3}[$ (c) $\varnothing$ (d) $\mathbb{R}$

(16) $\lim\limits_{x \to -3} \frac{x^2 + 4x + 3}{x^2 - 9} =$ ....

(a) not exist (b) $\frac{1}{3}$ (c) $-\frac{1}{3}$ (d) 1

(17) The function $f : f(x) = (x - 1)^2 + 2$ is increasing on the interval ....

(a) $\mathbb{R}$ (b) $]-\infty , 1[$ (c) $]1 , \infty[$ (d) $]-1 , 1[$

(18) In Δ ABC , a = 27 cm. , m ($\angle$ B) = 82° , m ($\angle$ C) = 56°
, then its surface area $\simeq$ .... cm^2.

(a) 540 (b) 447 (c) 350 (d) 400

(19) $\lim\limits_{x \to -2} \frac{x^7 + 128}{x^4 - 16} =$ ....

(a) 9 (b) -9 (c) -14 (d) 14

(20) If $x^{\frac{5}{3}} = 2y^{\frac{4}{3}} = 32$, then $x + y =$ ....

(a) 16 (b) zero (c) 16 , -16 (d) zero , 16

(21) The number of possible solutions of Δ ABC in which m ($\angle$ C) = 115° , c = 12 cm.
, a = 9 cm. is ....

(a) 1 (b) 2 (c) 3 (d) zero

(22) The domain of the function $f : f(x) = \frac{1}{\sqrt{9 - x^2}}$ is ....

(a) $\mathbb{R}$ (b) $\mathbb{R} - [-3 , 3]$ (c) $\mathbb{R} - \{-3 , 3\}$ (d) $]-3 , 3[$

(23) If $\log(x + 11) = 2$, then $x =$ ....

(a) -9 (b) 22 (c) 89 (d) 91

(24) $\lim_{x \to 4} \frac{(x-3)^2 - 1}{x - 4} =$ ....

(a) zero (b) 2 (c) 3 (d) 4

(25) If ABC is a triangle in which $c^2 = (a + b)^2 - ab$, then $m(\angle C) =$ ....°

(a) 30 (b) 45 (c) 60 (d) 120

(26) The function $f : f(x) = \log_a x$, is decreasing when $a \in$ ....

(a) $[0 , \infty[$ (b) $]-\infty , 0[$ (c) $]0 , 1[$ (d) $]1 , \infty[$

(27) $\lim_{x \to 0} \frac{(x+2)^5 - 32}{x} =$ ....

(a) 80 (b) -8 (c) -80 (d) $\frac{1}{8}$

Second Essay questions

Answer the following questions :

1 Draw the graph of the function $f : f(x) = \sqrt{x^2 - 8x + 16}$, from the graph determine the domain , range and discuss the monotony of f

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2 If the function $f : f(x) = \begin{cases} \frac{x^7 - 128}{x^3 - 8} & , x \neq 2 \\ k & , x = 2 \end{cases}$ is continuous in $\mathbb{R}$, find the value of k

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Mathematics Inspection

First Multiple choice questions



Choose the correct answer from those given :

(1) The domain of the function f where $f(x) = \frac{x + 1}{\sqrt[3]{x - 1}}$ is ....

(a) $\mathbb{R} - \{1\}$ (b) $\mathbb{R} - \{-1\}$ (c) $[-1 , \infty[$ (d) $\mathbb{R}$

(2) If $f(x) = x - 3$, $g(x) = x^2$, then $(f \circ g)(x) =$ ....

(a) $(x - 3)^2$ (b) $x^2 - 3$ (c) $x^2 + 3$ (d) $\sqrt{x - 3}$

(3) If f is an even function and $f(5) = 1$, $f(-5) = 3 - k$, then $k =$ ....

(a) 1 (b) 5 (c) 3 (d) 2

(4) The range of the function $f : f(X) = \frac{3X^2 - 3}{X^2 - 1}$ is ....

(a) $\mathbb{R} - \{1 , -1\}$ (b) $\mathbb{R} - \{3 , -3\}$ (c) $\{3 , -3\}$ (d) $\{3\}$

(5) The function $f : f(X) = X^2 + X^4 + 1$ is symmetric about ....

(a) the origin. (b) the X-axis.

(c) the y-axis. (d) it has neither symmetric point nor symmetric line.

(6) If $f(X) = |X - 2| + 4$, then the solution set of the equation $f(X + 2) = 6$ is ....

(a) $\{0 , 4\}$ (b) $\{2 , -2\}$ (c) $\{2 , 4\}$ (d) $\{-2 , -4\}$

(7) If $2^{X-1} = 44$, then $2^{X-2} =$ ....

(a) 18 (b) 22 (c) 10 (d) 16

(8) If $f(X) = (5)^{-X}$, then $\frac{f(X-1)}{f(X+1)} =$ ....

(a) 5 (b) $\frac{1}{5}$ (c) 25 (d) $\frac{1}{25}$

(9) If $f(X) = 3^X$, then the value of X which satisfies the equation :
$f(X+1) - f(X-1) = 24$ is ....

(a) 2 (b) 3 (c) 8 (d) zero.

(10) The S.S. of the equation $\log_X 81 = 4$ in $\mathbb{R}$ is ....

(a) $\{-3\}$ (b) $\{3\}$ (c) $\{3 , -3\}$ (d) $\{9\}$

(11) If $\log_3 5 = a$, then $\log_{15} 5 =$ ....

(a) a^2 (b) 3 a (c) $\frac{1}{a+3}$ (d) $\frac{a}{a+1}$

(12) The domain of the function $f : f(X) = \log_X (5 - X)$ is ....

(a) $]0 , 5[- \{1\}$ (b) $[0 , 5]$ (c) $]0 , 5[$ (d) $]-\infty , 5[$

(13) If $f(X) = X^3 + 7$, then $f^{-1}(-1) =$ ....

(a) 1 (b) 2 (c) -2 (d) 8

(14) $\lim\limits_{X \to 2} \frac{X - 3}{X - 2} =$ ....

(a) -1 (b) $\frac{-3}{2}$ (c) $\frac{3}{2}$ (d) does not exist.

(15) If $\lim\limits_{X \to a} \frac{X^8 - a^8}{X^6 - a^6} = 48$, then $a =$ ....

(a) 4 (b) 6 (c) ± 4 (d) ± 6

(16) $\lim_{x \to \infty} (3x^{-5} + 4x^{-2} + 5) = \dots\dots$

(a) 12 (b) ∞ (c) 5 (d) zero

(17) $\lim_{x \to 0} \frac{x^2 + \sin^2 2x}{x \tan 2x} = \dots\dots$

(a) $\frac{2}{5}$ (b) $\frac{5}{2}$ (c) 1 (d) 5

(18) $\lim_{x \to \frac{1}{2}} (10) = \dots\dots$

(a) 5 (b) 20 (c) 10 (d) $10\frac{1}{2}$

(19) If $f(x) = \begin{cases} x^2 - 1 & , x > 2 \\ 3x + 1 & , x \le 2 \end{cases}$, then $\lim_{x \to 3} f(x) = \dots\dots$

(a) does not exist. (b) 3 (c) 8 (d) 7

(20) If $f : f(x) = \begin{cases} x^2 - 2x & \text{at } x \ge 1 \\ kx - 3 & \text{at } x < 1 \end{cases}$ is continuous at $x = 1$, then k = $\dots\dots$

(a) zero (b) 1 (c) 2 (d) 3

(21) If $\lim_{x \to \infty} \frac{a x^2 - 5x}{2x + 3x^2} = 3$, then a = $\dots\dots$

(a) 3 (b) 6 (c) 9 (d) 12

(22) In triangle ABC , m (∠ A) = 45° , the length of the radius of its circumcircle = 6 cm. , then a = $\dots\dots$ cm.

(a) 13 (b) $6\sqrt{2}$ (c) 12 (d) $\sqrt{2}$

(23) If ABCD is a cyclic quadrilateral , then cos A + cos C = $\dots\dots$

(a) 1 (b) zero (c) $\frac{1}{2}$ (d) – 1

(24) If Δ ABC is a right-angled at ∠ B and b = 10 cm. , then $\frac{a}{\sin A} + \frac{c}{\sin C} = \dots\dots$ cm.

(a) 10 (b) 20 (c) 40 (d) 100

(25) If the area of Δ ABC = 12 cm^2 , then $(b^2 + c^2 - a^2) \tan A = \dots\dots$

(a) 12 (b) 24 (c) 48 (d) 96

(26) In Δ ABC , a = 9 cm. , b = 15 cm. , m (∠ C) = 106° , then its perimeter ≃ $\dots\dots$ cm.

(a) 44 (b) 24 (c) 34 (d) 28

(27) If the perimeter of Δ ABC is 24 cm. and sin A + sin B = 3 sin C , then c = $\dots\dots$ cm.

(a) 4 (b) 6 (c) 8 (d) 9

Second | Essay questions

Answer the following questions :

1 If $f(x) = \begin{cases} \frac{(x-3)^6 - 1}{x-4} & , x > 4 \\ x + 2 & , x < 4 \end{cases}$, find : $\lim_{x \to 4} f(x)$

2 Find the solution set in $\mathbb{R}$: $|2x - 3| + 3 > 7$

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First | Multiple choice questions



Choose the correct answer from those given :

(1) The domain of the function $f : f(x) = \frac{5}{\sqrt{x+1} - 2}$ is ....

(a) $[-1, \infty[- \{3\}$ (b) $[-1, \infty[- \{5\}$ (c) $]-1, \infty[- \{3\}$ (d) $[-1, \infty[$

(2) If $f : \mathbb{R} \longrightarrow \mathbb{R}$, $f(x) = 3x + 1$, $g(x) = \begin{cases} 2x + 1 & , x > 2 \\ 3x & , x < 2 \end{cases}$

, then $(f \circ g)(3) =$ ....

(a) 21 (b) 22 (c) 28 (d) 30

(3) If $f : (x) = \frac{a}{x+b} + c$ where a , b , c are real numbers and its point of symmetry is (4 , 4)

, then $a^{b+c} =$ ....

(a) a^{16} (b) a^{8} (c) 1 (d) zero

(4) If $f(x) = |x - 3| + 1$, then the S.S. of the equation : $f(x + 3) = 4$ is ....

(a) $\{3, -3\}$ (b) $\{3, 0\}$ (c) $\{0, -3\}$ (d) $\{3\}$

(5) The function $f(x) = (x - 2)^2 + 1$ is increasing in the interval ....

(a) $]2, \infty[$ (b) $]-1, \infty[$ (c) $]1, \infty[$ (d) $]-\infty, 2[$

(6) Assume that the function $f(x) = x^3$ is translated 3 units to the right and 2 units downwards and the resulting curve is g (x) , then g (– 1) = ...

(a) – 64 (b) 6 (c) – 1 (d) – 66

(7) If $7^{x-1} = 3^{2x-2}$, then $5^{x+1} =$ ....

(a) zero (b) 25 (c) 1 (d) 5

(8) The set of real roots of the equation : $(x - 5)^4 = 16$ is ....

(a) $\{2, -2\}$ (b) $\{7\}$ (c) $\{3\}$ (d) $\{3, 7\}$

(9) If $2^a = x$, $5^a = y$, $7^a = z$, then $140^a =$ ....

(a) $x y z$ (b) $x y^2 z$ (c) $x^2 y z$ (d) $x y z^2$

(10) If $f(x) = 2x + k$ is the inverse function of $g(x) = m x + 3$, then $m \times k =$ ....

(a) 3 (b) 6 (c) -12 (d) -3

(11) If $\log_2 x = \log_5 125$, then $\log_8 x =$ ....

(a) zero (b) 1 (c) 8 (d) 512

(12) If $-2 \log_3 [2 + \log_5 (x - 3)] = -2$, then $x =$ ....

(a) 8 (b) -8 (c) 1 (d) -1

(13) If the curve of the function $f(x) = \log_a x$ passes through the point (8 , 3) , then $f(4) =$ ....

(a) 1 (b) 2 (c) -2 (d) $\frac{1}{4}$

(14) If ABC is a triangle in which $a - b = 4$ cm. , $\sin A = \frac{3}{2} \sin B$, then $a =$ ....

(a) 12 (b) 6 (c) 4 (d) 8

(15) The number of possible solutions of triangle ABC in which $a = 6$ cm. , $b = 9$ cm. and $m(\angle A) = 30°$ is ....

(a) 0 (b) 1 (c) 2 (d) an infinite number.

(16) In triangle LMN if $\frac{\sin M}{\sin N} = 2 \cos L$, then ....

(a) $m = n$ (b) $\ell = n$ (c) $\ell = m$ (d) $\ell = m = n$

(17) In triangle XYZ , $xyz : \sin X \sin Y \sin Z =$ .... (where r is radius of its circumcircle)

(a) $2r$ (b) $8r$ (c) $8r^2$ (d) $8r^3$

(18) In triangle DEF if $e = f$, then $\cos E =$ ....

(a) $2e^2 : f$ (b) $d : 2f$ (c) $f : 4d$ (d) $e : 2d$

(19) ABC is a triangle in which : $a^2 + b^2 - c^2 + ab = 0$, then $m(\angle C) =$ ....°

(a) 30 (b) 60 (c) 120 (d) 150

(20) $\lim_{x \to 1} \frac{3 - \sqrt{x + 8}}{1 - x^2} =$ ....

(a) $\frac{1}{2}$ (b) -4 (c) $\frac{1}{6}$ (d) $\frac{1}{12}$

(21) If $\lim_{x \to 2} \frac{x^2 - 8x + m}{x^2 - 4} = k$, then $k + m =$ ....

(a) 10 (b) 11 (c) 12 (d) 13

(22) If $\lim_{x \to a} \frac{x^5 - a^5}{x^2 - a^2} = 20$, then $a =$ ....

(a) 1 (b) 2 (c) 3 (d) 4

(23) If $m \in \mathbb{R}$, $\lim\limits_{x \to \infty} \frac{(m+1)x^2 - x + 1}{(m+3)x^2 - 5x + 2} = -1$, then m = ...

(a) 1 (b) – 1 (c) 2 (d) – 2

(24) If $f(x) = \frac{3x+9}{|x+3|}$, then $(f(-3)^+)^2 - (f(-3)^-)^2 =$ ....

(a) zero (b) 9 (c) 1 (d) 18

(25) If $\lim\limits_{x \to 0} \frac{\tan mx}{kx} = 2$, $\lim\limits_{x \to 0} \frac{\sin kx}{nx} = 3$, then : $\frac{m}{n} =$ ....

(a) 6 (b) $\frac{3}{2}$ (c) $\frac{2}{3}$ (d) 1

(26) If $\lim\limits_{x \to \infty} (a x^3 + 3x - 5) = -\infty$, then a could be ....

(a) 2 (b) 3 (c) – 4 (d) zero

(27) **In the opposite figure :**

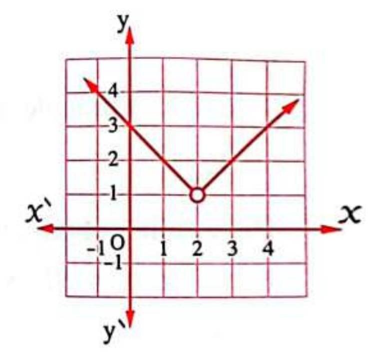
$f(2) =$ ....

(a) undefined

(b) 1

(c) zero

(d) 2



Second | Essay questions

Answer the following questions :

1 Draw the curve of the function : $f(x) = 2 - (3x + 1)^2$ and from the graph find the range of the function and discuss its monotony.

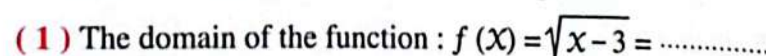
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2 Find the value of a and b which make the function f continuous at $x = 2$

where $f(x) = \begin{cases} a x + b & , \; x > 2 \\ 3 & , \; x = 2 \\ b - a x^2 & , \; x < 1 \end{cases}$



6 Alexandria Governorate — Montazah Zone



First | Multiple choice questions

Interactive test ⑥

Choose the correct answer from those given :

(1) The domain of the function : $f(x) = \sqrt{x-3} =$ ....

(a) $]3 , \infty[$ (b) $[3 , \infty[$ (c) $]-\infty , 3[$ (d) $]-\infty , 0[$

(2) The even function of the following is $f(x) =$ ....

(a) x^3 (b) $x \cos(x)$ (c) $x \sin(x)$ (d) $x + \cos(x)$

(3) The solution set of the inequality : $\sqrt{x^2 - 6x + 9} < 2$ in $\mathbb{R}$ is ....

(a) $[1, 5]$ (b) $\mathbb{R} - \{1, 5\}$ (c) $]1, 5[$ (d) $\mathbb{R} -]1, 5[$

(4) The function $f(x) = 3 - |x|$ is decreasing in .... $f(x) : \mathbb{R} \longrightarrow \mathbb{R}$

(a) $]3, \infty[$ (b) $]0, \infty[$ (c) $]-\infty, 3[$ (d) $]-\infty, 0[$

(5) If $f(x) = 3x + 5$ and $g(x) = 2x + 7$, then the coefficient of x in $f(g(x)) =$ ....

(a) 3 (b) 2 (c) 6 (d) 35

(6) Express the following inequality : $x > 6, x < -6 =$ ....

(a) $|x| < 6$ (b) $|x| > 6$ (c) $|x| < -6$ (d) $|x| > -6$

(7) If $3^x = 2^y$, then $18^x =$ ....

(a) 2^{x+2y} (b) 2^{2x+2y} (c) 2^{2x+2y} (d) 2^{x+y}

(8) If $(2x - 1)^4 = 81$, then $x \in$ ....

(a) $\{1\}$ (b) $\{1, -2\}$ (c) $\{2\}$ (d) $\{-1, 2\}$

(9) If $3^{f(x)} = 2x - 1$, then $f^{-1}(0) =$ ....

(a) 1 (b) -1 (c) 2 (d) 5

(10) If $\log_x(3x - 2) = 2$, then $x \in$ ....

(a) $\{2\}$ (b) $\{1\}$ (c) $\{1, 2\}$ (d) $\{3, 2\}$

(11) The solution set of the equation : $3^{x+1} + 3^x = 12$ is ....

(a) $\{0\}$ (b) $\{1\}$ (c) $\{3\}$ (d) $\{0, 1\}$

(12) If $\log_b a \times \log_a b =$ ....

(a) ab (b) a^2b^2 (c) $a + b$ (d) 1

(13) If $f(x) = 2^x$, then $\frac{f(x+1) + f(x)}{f(x-1)} =$ ....

(a) 3 (b) 6 (c) 4 (d) 8

(14) If $\log_3 x = 2$, then $\log_3(9x) + \log_6(4x) =$ ....

(a) 3 (b) 4 (c) 5 (d) 6

(15) If $h(x) = (f(x))^2 + 1$ and $\lim_{x \to 7} f(x) = 3$, then $\lim_{x \to 7} \frac{h(x)}{f(x)} =$ ....

(a) 3 (b) $\frac{10}{3}$ (c) $\frac{8}{3}$ (d) 10

(16) $\lim\limits_{x \to \infty} \frac{3kx}{4x+3} = 6$, then k = ...

(a) 6 (b) $\frac{3}{4}$ (c) 8 (d) 3

(17) If $f(x) = \begin{cases} \frac{\sin ax}{x} & , x > 0 \\ \cos 3x + 4 & , x < 0 \end{cases}$ has a limit at $x = 0$, then a = ...

(a) 7 (b) 12 (c) 5 (d) 3

(18) $\lim\limits_{x \to 0} \left(\frac{6x}{\sin 2x} - \frac{\tan 10x}{\sin x}\right) =$ ....

(a) – 7 (b) 3 (c) 7 (d) – 3

(19) $\lim\limits_{x \to \infty} \frac{(3x+2)(2x-1)}{x(3x+4)} =$ ....

(a) 2 (b) 3 (c) 6 (d) – 2

(20) $\lim\limits_{x \to 2} \frac{x^7 - 128}{x - 2} =$ ....

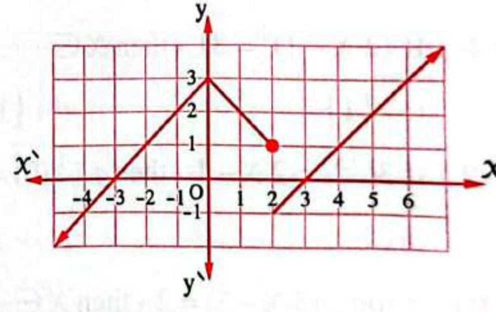
(a) 14 (b) 224 (c) 696 (d) 448

(21) In the opposite figure :

$\lim\limits_{x \to 2} f(x) =$ ....

(a) 3 (b) – 1

(c) 1 (d) not exist.



(22) In a triangle ABC if : 3 sin A = 2 sin B = 4 sin C , then a : b : c = ...

(a) 4 : 6 : 3 (b) 3 : 4 : 6 (c) 6 : 4 : 3 (d) 3 : 2 : 4

(23) In Δ ABC if : $\frac{a^2 + b^2 - c^2}{2ab} = \frac{a}{2r}$ where r is the radius of the circumcircle of the Δ ABC , then the triangle ABC is ....

(a) equilateral. (b) obtuse. (c) acute. (d) right.

(24) In Δ ABC if : $a^2 + b^2 - c^2 = 2abk$ where "k" is constant , then k could be ....

(a) $\frac{-1}{2}$ (b) – 1 (c) 1 (d) 2

(25) Δ ABC , m (∠ A) = 60° , m (∠ C) = 30° , c = 6 cm. , then b = ...

(a) $6\sqrt{3}$ (b) 12 (c) 6 (d) $12\sqrt{3}$

(26) In Δ ABC if : b = 30 cm. , c = 14 cm. , m (∠ A) = 60° , then a = ... cm.

(a) 26 (b) 14 (c) 28 (d) 24

(27) In Δ ABC : $\frac{a}{2r} =$ .... where r is the radius length of the circumcircle of the triangle ABC

(a) sin A (b) cos A (c) tan A (d) sin B

Second Essay questions

Answer the following questions :

1 Graph the curve of the function : $f(X) = \frac{1}{X-1} + 2$, then determine the domain , the range and the monotony of function.

2 If $f(X) = \begin{cases} \frac{X^2+6}{a} & , X < 3 \\ 3b & , X > 3 \end{cases}$ and $\lim_{X \to 3} f(X)$ is exist then find the value of a b.



7 Alexandria Governorate — Borg Al Arab Zone

First Multiple choice questions



Interactive test ⑦

Choose the correct answer from those given :

(1) The number of possible solutions of Δ XYZ in which m ($\angle$ X) = 30° , X = 6 cm. , y = 9 cm. is ....

(a) 0 (b) 3 (c) 1 (d) 2

(2) If the area of Δ XYZ = 12 cm.² , X = 8 cm. , m ($\angle$ Y) = 30° , then z = ... cm.

(a) 4 (b) 8 (c) 6 (d) 12

(3) In Δ XYZ if : 2 sin X = 3 sin Y , YZ = 12 cm. , then XZ = ... cm.

(a) 12 (b) 8 (c) 3 (d) 2

(4) If the area of Δ ABC = 24 cm.² and the length of the radius of circumcircle = $\sqrt{12}$ cm. , then sin (A) sin (B) sin (A + B) = ...

(a) 1 (b) 6 (c) 12 (d) 24

(5) In Δ XYZ if : $X^2 = y^2 + z^2 + y z$, then m ($\angle$ X) = ...°

(a) 120 (b) 150 (c) 60 (d) 30

(6) In Δ XYZ if : X = 30 cm. , y = 14 cm. , m ($\angle$ Z) = 60° , then z = ... cm.

(a) 16 (b) 26 (c) 15 (d) 17

(7) If f is one-to-one function in which $f(5 - 3k) = f(k - 3)$, then k = ...

(a) 3 (b) 5 (c) 2 (d) 8

(8) If f and g are two functions where $f(X) = 4X - 12$, $g(X) = aX + 3$ and each one of them is inverse function of other , then a = ...

(a) – 4 (b) 4 (c) 3 (d) 0.25

(9) If $f(x) = 3x + 2$, $g(x) = 2x + k$ and $(f \circ g)(x) = (g \circ f)(x)$, then $k =$ ....

(a) 4 (b) 3 (c) 1 (d) 4

(10) The domain of the function $f(x) = \sqrt{x-5} + \sqrt{5-x} =$ ....

(a) $]-5 , 5[$ (b) $\{5\}$ (c) $\{-5 , 5\}$ (d) $[-5 , 5[$

(11) If f is even function its domain $[5 - k , 2k - 7]$, then $k =$ ....

(a) 2 (b) 4 (c) 10 (d) 12

(12) The solution set of the inequality : $|x-3| - 3|x-3| > 2$ is ....

(a) $]1 , -1]$ (b) $\varnothing$ (c) $\mathbb{R}$ (d) $]2 , 4[$

(13) If $7^x = 4$, $4^y = 49$, then $xy =$ ....

(a) 20 (b) 2 (c) 7 (d) 4

(14) The solution set of the equation : $2x + \sqrt{25x} - 3 = 0$ is ....

(a) $\{-2 , 3\}$ (b) $\{2 , 3\}$ (c) $\{0.25 , 9\}$ (d) $\{0.25\}$

(15) If $f(x) = 2^x$, $f(x+1) - f(x-1) = 24$, then $x =$ ....

(a) 3 (b) 16 (c) 4 (d) 8

(16) If L , M are two roots of the equation : $x^2 - 5x + 4 = 0$

, then $\log_2 (L) + \log_2 (M) =$ ....

(a) 2 (b) 4 (c) 12 (d) 16

(17) If $f(x) = \log_b (2x + 4)$ and $f^{-1}(5) = 14$, then $b =$ ....

(a) 2 (b) 4 (c) 6 (d) 7

(18) An amount of 5000 pounds is deposited in a bank gives a yearly compound interest 5 % for 7 years ≈ .... pounds.

(a) 7035.5 (b) 6750 (c) 8500 (d) 5350

(19) If $x^{\log x} = 10$, then $x =$ ....

(a) $\{10 , 3\}$ (b) $\{10 , 0.1\}$ (c) $\{0.2 , 10\}$ (d) $\{1.25\}$

(20) $\lim\limits_{x \to \infty} (x^2 - x^3 + 3) =$ ....

(a) 3 (b) -1 (c) $-\infty$ (d) ∞

(21) If $\lim\limits_{x \to 5} f(x) = 4$, then $\lim\limits_{x \to 5} \left(f(x) - 4\right) =$ ....

(a) 8 (b) 5 (c) 4 (d) 0

(22) $\lim\limits_{x \to -1} \dfrac{x^2 + kx + m}{x^2 - 1} = 3$, then $k + m =$ ....

(a) -4 (b) -5 (c) -9 (d) -8

(23) $\lim\limits_{x \to 3} \dfrac{2x^2 - 5x - 3}{2x^2 - 3x - 9} =$ ....

(a) $\frac{5}{9}$ (b) $\frac{7}{9}$ (c) 2 (d) 9

(24) $\lim\limits_{x \to 1} \frac{\sqrt{x+3}-2}{x^2-1} =$ ....

(a) 2 (b) 0.25 (c) 0.125 (d) 8

(25) $\lim\limits_{x \to -2} \frac{x^7+128}{x^4-16} =$ ....

(a) – 14 (b) 14 (c) – 9 (d) 9

(26) $\lim\limits_{x \to \infty} \left(\sqrt{x^2+4x} - x\right) =$ ....

(a) 2 (b) 4 (c) – 1 (d) – 2

(27) $\lim\limits_{x \to 0} (6x \csc 3x) =$ ....

(a) 9 (b) 4 (c) 2 (d) 18

Second Essay questions

Answer the following questions :

1 Draw the curve of the function $f(x) = |x^2 - 2|$ and determine its range and type whether it is even , odd or otherwise.

2 Discuss the continuity of the function : $f(x) = |x-1| - 2$ at $x = 1$

8 El-Kalyoubia Governorate



Mathematics Inspection

First Multiple choice questions

Interactive test ⑧



Choose the correct answer from those given :

(1) The domain of the function f where $f(x) = \sqrt[4]{x-4}$ is ....



(a) $\mathbb{R}$ (b) $\mathbb{R} - \{4\}$ (c) $\mathbb{R} - [-2, 2]$ (d) $[4, \infty[$

(2) If $f(x) = 2x$, $g(x) = \frac{1}{2x}$, $f(g(x)) = 4$, then $x =$ ....

(a) $\frac{1}{6}$ (b) 6 (c) 4 (d) $\frac{1}{4}$

(3) If f is a function where $f :]-3, 3] \longrightarrow \mathbb{R}$, $f(x) = x^2 + 1$, then the function $f(x)$ is ....

(a) even. (b) odd. (c) one-to-one. (d) neither odd nor even.

(4) The range of the function $f : f(x) = \frac{1}{|x|}$ is ....

(a) $\mathbb{R} - \{0\}$ (b) $]0, \infty[$ (c) $[0, \infty[$ (d) $\{0\}$

(5) The solution set of the inequality : $|x - 1| > 0$ ....

(a) $\mathbb{R} - \{1\}$ (b) $]-\infty, 1]$ (c) $]-1, \infty[$ (d) $\{1\}$

(6) All the following functions are one-to-one except ....

(a) $f(x) = x + 3$ (b) $f(x) = x^3 + 2$ (c) $f(x) = 2^x$ (d) $f(x) = \sin x$

(7) If $3^{x-2} = \sqrt[4]{27}$, then $x =$ ....

(a) $\frac{11}{4}$ (b) $\frac{4}{3}$ (c) $\frac{3}{4}$ (d) 6

(8) The straight line y = 8 cuts the curve of the function $f : f(x) = 2^x$ at the point ....

(a) (0 , 1) (b) (2 , 0) (c) (2 , 8) (d) (3 , 8)

(9) The image of the point (– 1 , 4) by reflection in the straight line $y = x$ is ....

(a) (– 1 , 4) (b) (4 , – 1) (c) (1 , 4) (d) (1 , – 4)

(10) If $\log_5 \sqrt{x+1} = \frac{1}{2}$, then $x =$ ....

(a) 2 (b) 4 (c) 5 (d) 6

(11) The function $f : f(x) = \log_a x$ is decreasing for every $a \in$ ....

(a) $]0 , \infty[$ (b) $]-\infty , 0[$ (c) $]0 , 1[$ (d) $]1 , \infty[$

(12) $\frac{1}{\log_3 24} + \frac{1}{\log_2 24} + \frac{1}{\log_4 24} =$ ....

(a) 1 (b) 2 (c) 4 (d) 24

(13) The solution set of the equation : $\log x^2 - (\log x)^2 = 0$ ....

(a) {1} (b) {1 , 10} (c) {1 , 100} (d) {100}

(14) $\lim\limits_{x \to 0} \frac{2x + 5x^{-2}}{3x + x^{-2}} =$ ....

(a) $\frac{2}{3}$ (b) $\frac{10}{3}$ (c) $\frac{5}{3}$ (d) 5

(15) $\lim\limits_{x \to 0} \frac{8 + 7x}{\cos x} =$ ....

(a) 7 (b) 8 (c) 9 (d) 15

(16) If $\lim\limits_{x \to a} \frac{x^8 - a^8}{x^6 - a^6} = 48$, then a = ...

(a) 4 (b) 6 (c) ± 4 (d) ± 6

(17) $\lim\limits_{x \to \infty} \frac{1}{x}\sqrt{9 + 16x^2} =$ ....

(a) $2\sqrt{2}$ (b) 3 (c) – 3 (d) 4

(18) $\lim\limits_{x \to 0} \frac{1 - \cos x + \sin 6x}{1 - \cos x + \tan 3x} =$ ....

(a) 0 (b) 2 (c) $\frac{3}{6}$ (d) 18

(19) If $f(X) = \begin{cases} \dfrac{\tan 2X}{\log_3 27^X} & , \dfrac{-\pi}{4} < X < 0 \\ X + \dfrac{2}{3} & , X > 0 \end{cases}$, then $\lim\limits_{X \to 0} f(X) = \ldots\ldots\ldots\ldots$

(a) 3 (b) $\frac{2}{3}$ (c) $\frac{3}{2}$ (d) does not exist

(20) If $m \in \mathbb{R}$ and $\lim\limits_{X \to \infty} \dfrac{(m+5)X^3 - X + 4}{3mX^3 - 2X + 9} = 2$, then $m = \ldots\ldots\ldots\ldots$

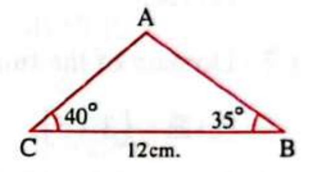
(a) 0 (b) $\frac{5}{3}$ (c) $\frac{4}{9}$ (d) 1

(21) $\lim\limits_{X \to 0} \dfrac{\sqrt{X+1} - 1}{X} = \ldots\ldots\ldots\ldots$

(a) 0 (b) $\sqrt{2}$ (c) $\frac{1}{2}$ (d) does not exist

(22) In the opposite figure :

The length of $\overline{AB} \simeq \ldots\ldots\ldots\ldots$ cm.



(a) 6 (b) 7

(c) 8 (d) 9

(23) In acute angled triangle ABC, $2a = \dfrac{b}{\sin B}$, then $m(\angle A) = \ldots\ldots\ldots\ldots^\circ$

(a) 30 (b) 45 (c) 60 (d) 75

(24) If the radius length of circumcircle of Δ ABC equals 4 cm. and $\sin A + \sin B + \sin C = 3$, then the perimeter of Δ ABC $= \ldots\ldots\ldots\ldots$ cm.

(a) 6 (b) 8 (c) 12 (d) 24

(25) In Δ ABC, if $5 \sin A \sin B = 6 \sin B \sin C = 9 \sin C \sin A$, then $m(\angle C) \simeq \ldots\ldots\ldots\ldots^\circ$

(a) 28 (b) 32 (c) 35 (d) 42

(26) In Δ ABC, if $a = 4$ cm., $b = 4\sqrt{3}$ cm., $m(\angle C) = 30^\circ$ cm., then $c = \ldots\ldots\ldots\ldots$ cm.

(a) 3 (b) 4 (c) 10 (d) 16

(27) In Δ ABC, $a = 15$ cm., $m(\angle B) = 30^\circ$, has a unique solution, then b could not be $\ldots\ldots\ldots\ldots$ cm.

(a) 15 (b) 30 (c) 7.5 (d) 8.5

Second Essay questions

Answer the following questions :

1 Draw the curve of the function f and determine the maximum value and monotonicity if : $f(X) = |X^2 - 4X - 5|$, $X \in [-1, 5]$

2 Discuss the continuity of the function defined by the following rule on its domain

$$f(x) = \begin{cases} x^2 - 3x + 2 & , \quad x \le 3 \\ 2 & , \quad 3 < x \le 4 \\ 6 - x^2 & , \quad x > 4 \end{cases}$$

9 El-Sharkia Governorate  Diarbnegn Directorate

First Multiple choice questions


Interactive test 9

Choose the correct answer from those given :

(1) If the function $f(x) = x^3$, $g(x) = \sqrt[3]{x}$, then : $(f \circ g)(x) =$ ....

(a) $|x|$ (b) x (c) x^3 (d) $\sqrt[3]{x}$

(2) Domain of the function : $f(x) = \frac{3}{x-5} + 1$ is ....

(a) $\mathbb{R} - \{3, 5\}$ (b) $\mathbb{R} - \{1, 5\}$ (c) $\mathbb{R} - \{5\}$ (d) $\mathbb{R} - \{1\}$

(3) Range of the function : $f(x) = -|x-1| + 3$ is ....

(a) $[3, \infty[$ (b) $[1, \infty[$ (c) $]-\infty, 1]$ (d) $]-\infty, 3]$

(4) If the function $f(x) = 3^{x+1}$, then S.S. of the equation : $f(x-1) = 9$ in $\mathbb{R}$ is ....

(a) $\{2\}$ (b) $\{\text{zero}\}$ (c) $\{4\}$ (d) $\{9\}$

(5) Domain of the function : $f(x) = \log_{(-x)}(x+3)$ is ....

(a) $]-3, 0[$ (b) $]-3, 0[- \{-1\}$ (c) $]-\infty, 0[$ (d) $]-3, \infty[$

(6) If the function : $y = 3x + 5$, then its inverse function is $y =$ ....

(a) $5x - 3$ (b) $\frac{x-3}{5}$ (c) $\frac{x-5}{3}$ (d) $3x - 5$

(7) The curve of the function $f(x) = \log_3(x-3)$ intersects x-axis at the point ....

(a) $(3, 3)$ (b) $(3, 0)$ (c) $(4, 0)$ (d) $(3, 4)$

(8) S.S. of the equation : $x^{\frac{4}{3}} - 8x^{\frac{2}{3}} - 9 = 0$ in $\mathbb{R}$ is ....

(a) $\{1, 27\}$ (b) $\{-1, 27, -27\}$ (c) $\{27, -27\}$ (d) $\{ \}$

(9) If $x \in \mathbb{R}^+$ where $\log_7(x) \times \log_3(7) = 3$, then $\log_3(x) =$ ....

(a) 21 (b) 10 (c) 4 (d) 3

(10) If $\log a^3 + 3\log b - \log c^{-3} = 3$, then : $a\,b\,c =$ ....

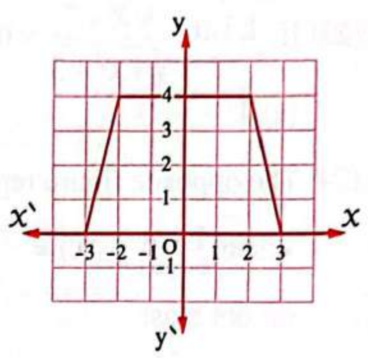
(a) 3 (b) 30 (c) 10 (d) 1000

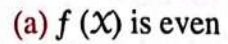
(11) S.S. of the inequality : $\sqrt{x^2 - 2x + 1} \ge 4$ in $\mathbb{R}$ is ....

(a) $]-3, 5[$ (b) $\mathbb{R} - [-3, 5]$ (c) $\mathbb{R} -]-3, 5[$ (d) $[-3, 5]$

(12) The opposite figure represents curve of function $f(x)$

all the following statements are true except :





(a) $f(x)$ is even

(b) increase in $]-3, -2[$

(c) $f(x)$ is one-to-one

(d) decrease in $]2, 3[$

(13) If the function $f(x) = \log(x)$, then S.S. of the equation : $f(x+8) - f(x-1) = 1$ in $\mathbb{R}$ ....

(a) $\{1\}$ (b) $\{9\}$ (c) $\{10\}$ (d) $\{2\}$

(14) Area of circumcircle of triangle ABC where a csc (A) = 10 equales .... area unit.

(a) 25π (b) 100π (c) 5π (d) 10π

(15) In ΔABC : b = 8 cm. , c = 10 cm. $\cos A = \frac{2}{5}$, then ΔABC is ....

(a) right. (b) equilateral. (c) isosceles. (d) scalene.

(16) Number of solutions of ΔABC : a = 5 cm. , b = 6 cm. , $m(\angle A) = 30°$ is ....

(a) zero (b) 1 (c) 2 (d) 3

(17) In ΔABC which of the following statement is always true : ....

(a) $\sin A + \cos B = a + b$

(b) $c = a \sin C$

(c) $a \sin B = b \sin A$

(d) $a = b \sin C$

(18) In ΔABC : a = 5 cm. , b = 3 cm. , $m(\angle C) = 120°$, then c = ... cm.

(a) 6 (b) 7 (c) 8 (d) 9

(19) In ΔABC : $\sin A + \sin C = 4 \sin B$, its perimeter = 35 cm. , then b = ... cm.

(a) 7 (b) 8 (c) 9 (d) 10

(20) If $\lim\limits_{x \to 3} \frac{x^n - 81}{x - 3} = m$, then n + m = ...

(a) 112 (b) 108 (c) 27 (d) 7

(21) If the function $f(x) = \begin{cases} \frac{\sin(a x)}{x} & , x > 0 \\ \frac{5x+6}{x+3} & , x < 0 \end{cases}$ has limit at $x \to 0$, then a = ...

(a) 2 (b) -2 (c) -5 (d) 5

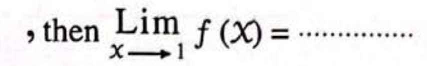
(22) If $\lim\limits_{x \to 0} \frac{x^2 + \tan^2(a x)}{x^2} = 10$, then a = ...

(a) $\sqrt{10}$ (b) 9 (c) ± 9 (d) ± 3

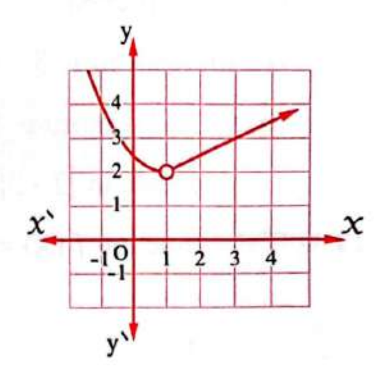
(23) If $\lim\limits_{x \to \infty} \frac{k x + 7}{\sqrt{4 x^2 + 3}} = 0.5$, then k = ...

(a) 4 (b) 2 (c) 1 (d) 0.5

(24) The opposite figure represents function $f(x)$



, then $\lim\limits_{x \to 1} f(x) =$ ....



(a) not exist. (b) zero.

(c) 1 (d) 2

(25) If $\lim\limits_{x \to 0} \frac{(x+1)^9 - k^9}{x} = m$, then k + m = ...

(a) 10 (b) 9 (c) 8 (d) 0

(26) If the function $f(x) = \begin{cases} \frac{x^2 - 1}{x - 1} & , \quad x \neq 1 \\ k & , \quad x = 1 \end{cases}$ continuous at $x = 1$, then k = ...

(a) 2 (b) – 2 (c) – 1 (d) 1

(27) The function $f(x) = \frac{x^2 - 5x}{\sqrt{x - 2} - 1}$ is continuous on interval ....

(a) $[2, \infty[$ (b) $]2, \infty[$ (c) $[2, \infty[- \{3\}$ (d) $]2, \infty[- \{3\}$

Second | Essay questions

Answer the following questions :

1 Draw the curve of $f(x) = \begin{cases} |x|^2 & , \quad x \geq 0 \\ \frac{1}{x} & , \quad x < 0 \end{cases}$, then from graph find increase and decrease intervals.

---

2 Find : $\lim\limits_{x \to -2} \frac{(x+3)^5 - 1}{x^2 - 4}$

10 El-Monofia Governorate



Shebin El-Kom Educational Directorate
Mathematics Supervision

First | Multiple choice questions

Interactive test 10

Choose the correct answer from those given :

(1) If $f(x) = x - 5$, $g(x) = |x^2 - 5|$, then $(f \circ g)(0) =$ ....

(a) 0 (b) 2 (c) 10 (d) undefined.

(2) The domain of the function $f(x) = \sqrt{x^2 - 25}$ is ....

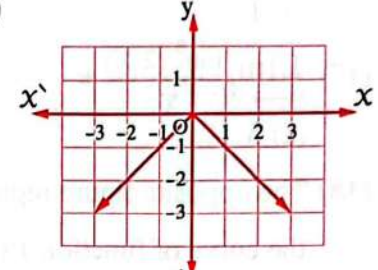
(a) $\mathbb{R} - \{5\}$ (b) $\mathbb{R} -]-5, 5[$ (c) $]-5, 5[$ (d) $[-5, 5]$

(3) Which of the following functions is an even function ....

(a) $f(x) = x^2 + \sin^2 x$ (b) $f(x) = x + \cos x$

(c) $f(x) = x^3$ (d) $f(x) = x^4 + \sin x$

(4) The opposite figure represents the curve of the function $f(x)$ which of the following is true ?



(a) range of f is $]-\infty, \infty[$

(b) domain of f is $]0, \infty[$

(c) f is increasing on $]0, \infty[$

(d) f is not one-to-one function

(5) The solution set of the equation : $3^{2x} + 12 \times 3^x + 27 = 0$ in $\mathbb{R}$ is ....

(a) $\{-9, -3\}$ (b) $\{1, 2\}$ (c) $\{-1, -2\}$ (d) $\varnothing$

(6) The solution set of the equation : $|2x + 6| = \sqrt{x^2}$ in $\mathbb{R}$ is ....

(a) $\{-6, -2\}$ (b) $\{6, 2\}$ (c) $\{-1, 3\}$ (d) $\varnothing$

(7) The value of : $\log_6 \log_{\sqrt{3}} 27 =$ ....

(a) -6 (b) -3 (c) 3 (d) 1

(8) $\sqrt[4]{81 x^8 y^{12}} =$ ....

(a) $3|x^2|y^3$ (b) $|3|x^2y^3$ (c) $3x^2|y^3|$ (d) $3x^2y^3$

(9) If $f(x) = \frac{1}{2}x - 6$, then $f^{-1}(12) =$ ....

(a) 6 (b) 12 (c) 24 (d) 36

(10) If $\log A = x$, $\log B = y$ where $A > 0$, $B > 0$, then $\log AB =$ ....

(a) $A + B$ (b) $x + y$ (c) xy (d) $(x)^y$

(11) The intersection point of the curve of the function $f(x) = 3^x + 5$ with y-axis is ....

(a) $(1, 0)$ (b) $(0, 5)$ (c) $(0, 6)$ (d) $(1, 8)$

(12) If $\log_2 2x + \log_2 x = 5$, then $x =$ ....

(a) 5 (b) ± 5 (c) 4 (d) ± 4

(13) The solution set of equation : $(4)^{x-3} = (8)^{2x-6}$ is ....

(a) $\{3\}$ (b) $\{0\}$ (c) $\{4\}$ (d) $\{5\}$

(14) $\lim\limits_{x \to 2} 5a = \dots\dots$

(a) 5 a (b) 10 (c) 10 a (d) does not exist.

(15) $\lim\limits_{x \to 0} \left(\frac{(x+2)\sin 12x}{3x} + \frac{1-\cos x}{x}\right) = \dots\dots$

(a) 1 (b) 4 (c) 8 (d) does not exist.

(16) $\lim\limits_{x \to \infty} \frac{A}{x^n} = \dots\dots$ where $A \in \mathbb{R}$, $n > 0$

(a) 1 (b) does not exist (c) ∞ (d) 0

(17) $\lim\limits_{x \to 0} \frac{\tan^3(2x)}{x^2} = \dots\dots$

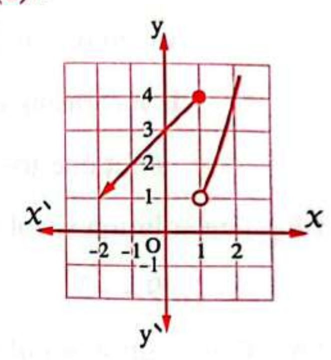
(a) 8 (b) 2 (c) 4 (d) 0

(18) The opposite figure represents the curve of function $f(x)$:

, then $\lim\limits_{x \to 1^+} f(x) = \dots\dots$

(a) 1 (b) 2

(c) 3 (d) does not exist.



(19) $\lim\limits_{x \to \infty} \frac{\sqrt{16x^2 - 5x}}{2x - 4} = \dots\dots$

(a) 2 (b) – 2 (c) 8 (d) – 8

(20) $\lim\limits_{x \to b} \frac{x^2 - b^2}{b - x} = \dots\dots$

(a) b (b) 2 b (c) – 2 b (d) – b

(21) $\lim\limits_{x \to 2} \frac{3x^5 - 96}{x^3 - 8} = \dots\dots$

(a) 20 (b) 60 (c) 96 (d) 32

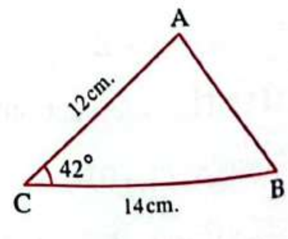
(22) In Δ XYZ the expression $2r(\sin X + \sin Y) = \dots\dots$

(a) $x + y$ (b) $y + z$ (c) z (d) perimeter of Δ XYZ

(23) In the opposite figure the surface area of Δ ABC to the nearest tenth = ... cm^2.

(a) 65.2 (b) 56.2

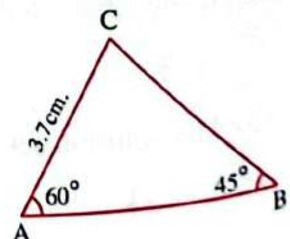
(c) 84.0 (d) 13



(24) In Δ ABC , then $a \simeq \dots\dots$ cm.

(a) 4.53 (b) 5.29

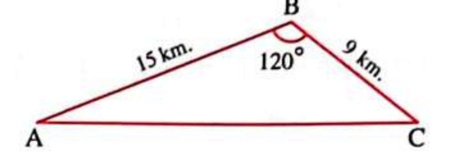
(c) 5.48 (d) 5.79



(25) The side lengths of triangle 4 cm. , 5 cm. , 6 cm. , then cos (X) = ...
where (X is the measure of the greatest angle in the triangle)

(a) $\frac{1}{2}$ (b) $\frac{-1}{8}$ (c) $\frac{9}{16}$ (d) $\frac{1}{8}$

(26) The perimeter of the opposite triangle = ... km.



(a) 21 (b) 30
(c) 45 (d) 24

(27) In any Δ LMN : $\ell^2 + m^2 - n^2 = 2\,\ell\, m \times$ ....

(a) 2 cos N (b) sin N (c) cos N (d) cos M

Second Essay questions

Answer the following questions :

1 Represent graphically the function $f : f(x) = |x|$, then use the graph of function f to represent the function $h(x) = -|x - 5| + 2$, then determine the range of $h(x)$

2 If the function $f : f(x) = \begin{cases} kx - 1 & , x > 3 \\ 5 & , x = 3 \\ x^2 + h & , x < 3 \end{cases}$ is continuous on $\mathbb{R}$, then what is the value of each of k and h ?

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The Central Mathematics Supervision
Official Language Schools

First Multiple choice questions

Choose the correct answer from those given :

(1) Δ ABC in which : 3 sin A = 4 sin B = 2 sin C , its perimeter = 39 cm. , then the length of $\overline{BC}$ is .... cm.

(a) 12 (b) 9 (c) 18 (d) 16

(2) Δ ABC where m (∠ B) = 30° , c = 9 cm. , b = 7 cm. , then m (∠ A) to nearest degree is ....

(a) 110° (b) 140° (c) 40° (d) 10° or 110°

(3) Δ ABC in which : $\frac{\sin A}{2} = \frac{\sin B}{3} = \frac{\sin C}{4}$, then m (∠ C) = ...° to nearest degree.

(a) 104 (b) 76 (c) 103 (d) 77

(4) ABCD is a quadrilateral in which AB = 3 cm. , BC = 7 cm. , CD = 5 cm. , AC = BD = 8 cm. , then ABCD is ....

(a) cyclic quadrilateral. (b) square. (c) rectangle. (d) rhombus.

(5) LMN is a triangle , m (∠ L) = 30° , ℓ = 6 cm. , m = 9 cm. , then the number of triangles that satisfies this conditions is ....

(a) 0 (b) 1

(c) 2 (d) the information is not enough.

(6) Δ ABC if : $a^2 + b^2 - c^2 = \sqrt{3}$ ab , then m (∠ C) = ...

(a) 30° (b) 60° (c) 12° (d) 150°

(7) The function $f(x) = \frac{|2+x| - |2-x|}{|2+x| + |2-x|}$ is ....

(a) odd. (b) even.

(c) even and odd. (d) neither even nor odd.

(8) The solution set of the inequality : $|2x - 6| + |3 - x| > 12$ is ....

(a) $]-1 , 7[$ (b) $\mathbb{R} - [3 , 9]$ (c) $\mathbb{R} - [-1 , 7]$ (d) $\mathbb{R} - [3 , 9[$

(9) The range of the function $f : [-2 , 3[\longrightarrow \mathbb{R}$, $f(x) = x^2$ is ....

(a) $[4 , 9[$ (b) $\mathbb{R}^+$ (c) $[0 , 9[$ (d) $[0 , 4]$

(10) If $f(x)$ is one-to-one function : $f(x)$ colud be = ...

(a) $\sin x$ (b) $\cos x$ (c) $\tan x$ (d) x

(11) If f is increasing function on the interval $]1 , \infty[$, then $g(x) = f(x+2)$ is increasing on ....

(a) $]-1 , \infty[$ (b) $]-\infty , 1[$ (c) $]-2 , \infty[$ (d) $]-3 , \infty[$

(12) If $f(x) = 2x + 1$, $g(x) = x^2 - 3$, then $(f \circ g)(x)$ = ...

(a) $2x^2 + 5$ (b) $4x^2 + 4x - 2$ (c) $4x + 3$ (d) $2x^2 - 5$

(13) If $2^{x+1} + 2^{x+3} = 80$, then x = ...

(a) 8 (b) 10 (c) 3 (d) 2

(14) The range of f^{-1} : $f(x) = \log_{(1-x)} x$ is ....

(a) $x \geq 0$ (b) $0 < x < 1$ (c) $x < 1$ (d) $0 \leq x \leq 1$

(15) If $5^x + \frac{125}{5^x} = 10^{\log 30}$, then x = ...

(a) 2 (b) 1 (c) 2 or 1 (d) 21

(16) If $\log_3 x \times \log_2 3 = 5$, such that $x \in \mathbb{R}^+$, then x = ...

(a) 2 (b) 32 (c) 5 (d) 3

(17) $5^{x-2} = 3 \times 4^{x+1}$, then $x \approx$ .... to nearest two decimal digits.

(a) 25.56 (b) 25.65 (c) 25.67 (d) 25.76

(18) The solution set of $\log x - \log_x 100 = 1$ is ....

(a) $\{1, 10\}$ (b) $\{10, 0.1\}$ (c) $\{100, 0.1\}$ (d) $\{1, \infty\}$

(19) The function $f : f(x) = a^x$ is increasing on its domain if ....

(a) $a > 0$ (b) $a > 1$ (c) $a = 1$ (d) $0 < a < 1$

(20) $\lim\limits_{x \to -3} \frac{x^2 + 4x + 3}{x^2 - 9} =$ ....

(a) 1 (b) $\frac{1}{3}$ (c) $\frac{1}{4}$ (d) $\frac{1}{2}$

(21) If $f(x) = x + 1$, $g(x) = \frac{x^2 - 1}{x - 1}$, $\lim\limits_{x \to 1} (f \circ g)(x) =$ ....

(a) 1 (b) 2 (c) -2 (d) 3

(22) $\lim\limits_{x \to \infty} \frac{x^3 + 5}{x(2x^2 + 3)} =$ ....

(a) $\frac{5}{3}$ (b) $\frac{5}{2}$ (c) $\frac{1}{2}$ (d) 1

(23) $\lim\limits_{x \to 3} \frac{x^2 - k^2}{x + 3} = \frac{4}{3}$, then $k =$ ....

(a) ± 2 (b) ± 9 (c) ± 1 (d) ± 3

(24) $\lim\limits_{x \to 0} \frac{2x + \sin 3x}{\tan 5x} =$ ....

(a) 0 (b) 1 (c) 5 (d) $\frac{6}{5}$

(25) $\lim\limits_{x \to \infty} \frac{ax + 6}{2x + 7} = 4$, $a \in \mathbb{R}$, then $a =$ ....

(a) 2 (b) 4 (c) 6 (d) 8

(26) $\lim\limits_{x \to 0} \frac{\sin x}{x} =$ .... where x is in degree measure.

(a) 1 (b) $\frac{\pi}{180}$ (c) $\frac{180}{\pi}$ (d) π

(27) If $f(x) = \begin{cases} 3x^2 + ax - 2 & , \quad x > 3 \\ 2x + b & , \quad x < 3 \end{cases}$, $\lim\limits_{x \to 3} f(x) = 16$, then $a + b =$ ....

(a) 4 (b) 10 (c) -13 (d) 7

Second Essay questions

Answer the following questions :

1 Graph the function $f : f(x) = x|x| + 2$ and from the graph find the range , its symmetry , state whether the function is even , odd or otherwise , is the function one-to-one ? and show monotony.

---

2 If the function $f : f(x) = \begin{cases} 3x - 2 & , \quad x \le -2 \\ ax + b & , \quad -2 < x < 5 \\ x^2 - 12 & , \quad x \ge 5 \end{cases}$ is continuous in $\mathbb{R}$, find each of a , b

12 El-Dakahlia Governorate



Maths Supervision

First Multiple choice questions

Choose the correct answer from the given ones :

(1) The point of symmetry of the curve of the function $f : f(X) = \frac{1}{X-3} + 4$ is ....

(a) $(3, -4)$ (b) $(-3, -4)$ (c) $(3, 4)$ (d) $(4, -3)$

(2) The domain of function $f : f(X) = \sqrt{X-3}$ is ....

(a) $\mathbb{R} - \{3\}$ (b) $[3, \infty[$ (c) ± 3 (d) $\mathbb{R}$

(3) If $f(X) = \sqrt[3]{X}$, $g(X) = X^3$, then $(f \circ g)(X) =$ ....

(a) X (b) $|X|$ (c) $-X$ (d) $\sqrt[3]{X}$

(4) The even function from the following functions that are defined by the following rules is ....

(a) $f(X) = \cos X$ (b) $f(X) = \tan X$

(c) $f(X) = X^2 \sin X$ (d) $f(X) = X^3$

(5) The axis of symmetry of the function $f : f(X) = X^2$ is the straight line ....

(a) $y = 0$ (b) $y = X$ (c) $X = 0$ (d) $y = -X$

(6) The solution set of the equation : $|X - 2| = 3$ is ....

(a) $\{2, 3\}$ (b) $[-1, 5]$ (c) $\{-1, 5\}$ (d) $\{-5, 5\}$

(7) If $5^{X-1} = 4^{X-1}$, then $X =$ ....

(a) 2 (b) 1 (c) 0 (d) 4

(8) If the exponential function of base a is increasing where $f : f(X) = a^X$, then ....

(a) $a > 0$ (b) $0 < a < 1$ (c) $a > 1$ (d) $a = 1$

(9) If f is a function where $f(X) = X^3 + 7$, then $f^{-1}(-1) =$ ....

(a) 1 (b) -2 (c) 2 (d) 8

(10) If $X^{\frac{3}{2}} = 64$, then $X =$ ....

(a) 512 (b) 4 (c) 16 (d) 2

(11) If $\log(X + 1) = 3$, then $X =$ ....

(a) -9 (b) 99 (c) 999 (d) -99

(12) $1 - \log 2 =$ ....

(a) $\log 5$ (b) $\log 20$ (c) $\log 2$ (d) $-\log 5$

(13) $\frac{3 \log 2}{\log 4 + \log 3} =$ ....

(a) $\log_3 2$ (b) $\log_{12} 8$ (c) $\log_7 2$ (d) $\log_7 8$

(14) $\lim\limits_{x \to 2} (1 - 3x) =$ ....

(a) -2 (b) 5 (c) -5 (d) 0

(15) $\lim\limits_{x \to 3} \frac{x^2 - x - 6}{x^2 + x - 12} =$ ....

(a) $\frac{5}{7}$ (b) -1 (c) $\frac{1}{7}$ (d) -5

(16) $\lim\limits_{x \to \infty} \frac{8x^3 + 3x + 4}{x^3 - 3} =$ ....

(a) 4 (b) 6 (c) 8 (d) 12

(17) If $\lim\limits_{x \to 4} \frac{x^2 - a}{x - 4}$ exists , then a = ...

(a) -4 (b) 16 (c) 8 (d) 0

(18) $\lim\limits_{x \to 5} \frac{x^4 - 625}{x^2 - 25} =$ ....

(a) 25 (b) 1 (c) 125 (d) 50

(19) $\lim\limits_{x \to 0} \frac{(x+2)^3 - 8}{x} =$ ....

(a) 8 (b) 0 (c) 12 (d) 16

(20) $\lim\limits_{x \to 0} \frac{2x + \sin 3x}{\tan 5x} =$ ....

(a) 5 (b) 1 (c) $\frac{6}{5}$ (d) 0

(21) If the function $f : f(x) = \begin{cases} \frac{x^3 - 27}{x - 3} & , x \neq 3 \\ 3k & , x = 3 \end{cases}$ is continuous at $x = 3$, then k = ...

(a) zero (b) 3 (c) 6 (d) 9

(22) In ΔABC , if $m(\angle A) = 30°$, $m(\angle C) = 60°$, $c = 15\sqrt{3}$, then a = ...

(a) 30 (b) 45 (c) 15 (d) 60

(23) In ΔABC , if $\frac{\sin A}{3} = \frac{2 \sin B}{5} = \frac{\sin C}{4}$, then a : b : c = ...

(a) 8 : 5 : 6 (b) 6 : 5 : 8 (c) 7 : 2 : 4 (d) 3 : 4 : 5

(24) The measure of the largest angle in a triangle whose side lengths are 3 cm. , 5 cm. and 7 cm. is ....°

(a) 110 (b) 150 (c) 100 (d) 120

(25) The number of possible solutions of Δ ABC in which m ($\angle$ A) = 42° , b = 10 cm. , a = 8 cm. is ……………

(a) zero (b) 1 (c) 2 (d) infinite number.

(26) If r is the length of the radius of the circumcircle of the triangle XYZ , then $\frac{y}{2 \sin Y}$ = ……………

(a) r (b) $\frac{1}{2}$ r (c) 2 r (d) 4 r

(27) In Δ XYZ , $y^2 + z^2 - x^2 = 2\, y\, z \times$ ……………

(a) cos X (b) cos Z (c) sin Z (d) sin X

Second Essay questions

Answer the following questions :

1 Draw the curve of the function f where $f(x) = (x-2)^2 + 1$, $x \in \mathbb{R}$

From graph : (1) Determine the range. (2) Discuss the monotony of the function.

2 **Find :** $\lim_{x \to 2} \frac{x^2 - 4}{x^2 - 5x + 6}$

13 Beni Suef Governorate



El-Wasta Directorate

First Multiple choice questions

Choose the correct answer from the given ones :

(1) If $f(x) = \frac{1}{x}$, $g(x) = \sqrt{x}$, then the domain of $(f \circ g)$ is ……………

(a) $[0, \infty[$ (b) $\mathbb{R} - \{0\}$ (c) $\mathbb{R}$ (d) $\mathbb{R}^+$

(2) If $f(x) = \sqrt[3]{x}$, $g(x) = x^3$, then $(f \circ g)(x)$ = ……………

(a) x (b) x^3 (c) $\sqrt[3]{x}$ (d) $|x|$

(3) The function which is one-to-one from the function defined by the following rules is ……………

(a) $f_1(x) = x^2$ (b) $f_2(x) = |x-1|$ (c) $f_3(x) = \frac{1}{x}$ (d) $f_4(x) = 3$

(4) If f is an odd function , a $\in$ the domain of f , then $f(a) + f(-a)$ = ……………

(a) zero (b) 2 f (a) (c) 2 a (d) f (a)

(5) The function $f : f(x) = |x|$ is increasing on the interval ……………

(a) $]0, \infty[$ (b) $]-\infty, 0[$ (c) $]-\infty, \infty[$ (d) $]-\infty, 0]$

(6) The curve of the function $f : f(x) = x^3 - 3$ is the same curve of the function $g : g(x) = x^3$ by a translation of magnitude 3 units in the direction of ....

(a) $\overrightarrow{Ox}$ (b) $\overleftarrow{Ox}$ (c) $\overrightarrow{Oy}$ (d) $\overleftarrow{Oy}$

(7) The solution set of the equation : $x^{\frac{2}{3}} = 25$ in $\mathbb{R}$ is ....

(a) $\{5\}$ (b) $\{125 , -125\}$ (c) $\{125\}$ (d) $\{5 , -5\}$

(8) The exponential function $f : f(x) = a^x$, $a > 1$, its curve approaches ....

(a) the x-axis (positive direction) (b) the x-axis (negative direction)

(c) the y-axis (positive direction) (d) the y-axis (negative direction)

(9) If $7^{x+1} = 3^{2x+2}$, then $x =$ ....

(a) -1 (b) zero (c) 4 (d) 1

(10) If f is a function where $f(x) = x + 2$, then $f^{-1}(x) =$ ....

(a) $x + 2$ (b) $-x + 2$ (c) $x - 2$ (d) $\frac{x}{2}$

(11) If $\log(x + 11) = 2$, then $x =$ ....

(a) -9 (b) 22 (c) 89 (d) 91

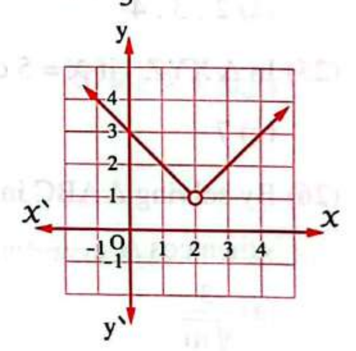
(12) $\log_2 5 \times \log_5 2 =$ ....

(a) 1 (b) 10 (c) $\log_2 10$ (d) $\log_5 10$

(13) If $3^x = 5$, then $x =$ ....

(a) 3 (b) $\log_3 5$ (c) $\log_5 3$ (d) $\frac{5}{3}$

(14) The opposite graph represents the curve of the function f , then $\lim\limits_{x \to 2} f(x) =$ ....



(a) -1 (b) 1

(c) 2 (d) does not exist.

(15) $\lim\limits_{x \to 3} \frac{x^3 - 27}{x^2 - 9} =$ ....

(a) $\frac{3}{2}$ (b) 3 (c) $4\frac{1}{2}$ (d) 27

(16) $\lim\limits_{x \to 2} \frac{x^2 + x - 6}{x^2 - 4} =$ ....

(a) $\frac{4}{5}$ (b) $\frac{5}{4}$ (c) $\frac{2}{5}$ (d) $\frac{-2}{5}$

(17) $\lim\limits_{x \to \infty} \frac{\sqrt{x^2 + 3}}{2x + 1} =$ ....

(a) $\frac{1}{2}$ (b) $\frac{3}{2}$ (c) 1 (d) 3

(18) $\lim\limits_{x \to \infty} \frac{x^{-2}+3}{x^{-3}+6} = $ ....

(a) $\frac{1}{2}$ (b) 2 (c) 3 (d) 6

(19) $\lim\limits_{x \to 0} \frac{2x+\sin 3x}{5x+\tan 2x} = $ ....

(a) 1 (b) $\frac{5}{7}$ (c) $\frac{7}{5}$ (d) -1

(20) $\lim\limits_{x \to 0} \frac{12-12\cos x}{x} = $ ....

(a) 12 (b) zero (c) 1 (d) 24

(21) If $f(x) = \begin{cases} x^2+2 , & x < 3 \\ 3x+1 , & x \geq 3 \end{cases}$, then $\lim\limits_{x \to 3} f(x) = $ ....

(a) -10 (b) 7 (c) 10 (d) does not exist.

(22) In Δ ABC , if m ($\angle$ A) = 30° , m ($\angle$ C) = 60° , c = $15\sqrt{3}$ cm.

, then a = ... cm.

(a) 15 (b) 30 (c) 45 (d) 60

(23) In triangle ABC , m ($\angle$ A) = 45° , the length of the radius of its circumcircle = 6 cm.

, then a = ... cm.

(a) 13 (b) $6\sqrt{2}$ (c) 12 (d) $\sqrt{2}$

(24) In Δ XYZ , if 3 sin X = 4 sin Y = 2 sin Z , then $x : y : z = $ ....

(a) 2 : 3 : 4 (b) 6 : 4 : 3 (c) 3 : 4 : 6 (d) 4 : 3 : 6

(25) In Δ XYZ , if $x = 5$ cm. , y = 3 cm. , m ($\angle$ Z) = $\frac{2}{3}\pi$, then z = ... cm.

(a) 7 (b) 8 (c) 9 (d) 4

(26) By solving Δ ABC in which a = 2 cm. , b = $4\sqrt{2}$ cm. , c = $2\sqrt{5}$ cm.

, then cos A = ...

(a) $\frac{3}{\sqrt{10}}$ (b) $\frac{4}{5}$ (c) $\frac{2}{\sqrt{10}}$ (d) $\frac{\sqrt{10}}{5}$

(27) The number of possible solutions of Δ ABC in which m ($\angle$ A) = 100° , b = 15 cm. and a = 12 cm. is ....

(a) zero (b) 1 (c) 2 (d) 3

Second Essay questions

Answer the following questions :

1 Find algebraically in $\mathbb{R}$ the solution set of the inequality : $|2x-5| \leq 9$

2 Discuss the continuity of the function f where $f(x) = \begin{cases} x & , \ x \le 1 \\ x + 1 & , \ x > 1 \end{cases}$ at $x = 1$

14 El-Menia Governorate



Matay Zone

First Multiple choice questions

Choose the correct answer from those given :

(1) In Δ XYZ , m ($\angle$ Y) = 30° , y = 6 cm. , then the length of raduis (r) = ... cm.

(a) 6 (b) 12 (c) 24 (d) 3

(2) In Δ ABC , if 3 sin A = 4 sin B = 6 sin C , then a : b : c = ...

(a) 2 : 3 : 4 (b) 4 : 3 : 2 (c) 3 : 2 : 4 (d) 6 : 4 : 3

(3) Δ ABC in which a = b = 5 cm. , c = 6 cm. , then cos A = ...

(a) 0.4 (b) 0.6 (c) 0.16 (d) 2.4

(4) If Δ ABC has two solutions and m ($\angle$ A) = 30° , b = 16 cm.

, then a = ... cm.

(a) 6 (b) 8 (c) 12 (d) 20

(5) $\log x - \log 3 = \log 9$, then x = ...

(a) 3 (b) 4 (c) 9 (d) 27

(6) $\log 2 = x$, $\log 3 = y$, then $\log 6$ = ...

(a) $x + y$ (b) $x y$ (c) $x - y$ (d) $\log x + \log y$

(7) $\lim\limits_{x \to \infty} (5 X^{70} + 8 X^{30} + 4)$ = ...

(a) 0 (b) 4 (c) 19 (d) ∞

(8) The curve of the function $f(x) = x^2 + 9$ is the same curve of the function $g(x) = x^2$ by translation .... unit in direction of $\overrightarrow{OY}$

(a) 9 (b) 3 (c) – 3 (d) – 9

(9) If $3^{x-1} = 81$, then x = ...

(a) 3 (b) 4 (c) 5 (d) 9

(10) If $f(x) = a x^3 + b$ is an odd function and $f(3) = 27$, then a + b = ...

(a) 1 (b) 27 (c) 0 (d) 30

(11) If $x \in [-1, 3]$, then $|2x - 2| \le$ ....

(a) 2 (b) 3 (c) 4 (d) 5

(12) If the function $f^{-1}(x) = \{(1, 2), (4, k)\}$ and its inverse function f where $f(x) = \{(3, 4), (n, 1)\}$, then $n + k =$ ....

(a) 6 (b) 5 (c) 1 (d) 22

(13) $\log_3 2 = A$, $\log_5 3 = B$, then $A \times B =$ ....

(a) $\log_5 2$ (b) $\log_2 5$ (c) $\log_3 10$ (d) $\log 5$

(14) $\lim_{x \to 4} \left(2x + \sqrt{x}\right) =$ ....

(a) 4 (b) 6 (c) 8 (d) 10

(15) $\sqrt{5} \times \sqrt[3]{2} = \sqrt[6]{x}$, then $x =$ ....

(a) 500 (b) 108 (c) 72 (d) 100

(16) $\frac{3^x + 2^x + 1}{5^x + 10^x + 15^x} = \frac{1}{25}$, then $x =$ ....

(a) 1 (b) 2 (c) -1 (d) -2

(17) $f : f(x) = \begin{cases} 2x & , x \le 3 \\ x^2 & , x > 3 \end{cases}$, then $f(-3) + f(1) + f(5) =$ ....

(a) 3 (b) 5 (c) 18 (d) 21

(18) The domain of function $f(x) = \frac{x+1}{\sqrt{x-1}+3}$ is ....

(a) $]1, \infty[$ (b) $[1, \infty[$ (c) $]-\infty, 3]$ (d) $]-\infty, 1]$

(19) $\lim_{x \to 3} \frac{x^5 - 243}{x - 3} =$ ....

(a) 115 (b) 405 (c) 45 (d) 500

(20) $\lim_{x \to 0} \frac{5x + 3 \sin x}{\tan 8x} =$ ....

(a) $\frac{5}{8}$ (b) $\frac{3}{8}$ (c) 1 (d) 8

(21) $\lim_{x \to -1} \frac{x^3 - x^2}{x^3 + 1} =$ ....

(a) 0 (b) -1 (c) not exist (d) $\frac{1}{3}$

(22) Measure of greatest angle in the triangle whose side lengths 7 cm. , 5 cm. , 3 cm. = ...°

(a) 120 (b) 150 (c) 60 (d) 30

(23) $\lim_{x \to 1} \frac{x^2 - 1}{x - 1} =$ ....

(a) 2 (b) -1 (c) 1 (d) undefined.

(24) $f(x) = \begin{cases} \frac{\sin^2 2x}{x^2} & , x < 0 \\ 5a - 6\cos x & , x > 0 \end{cases}$ and $\lim_{x \to 0} f(x)$ is exist , then a = ...

(a) 2 (b) 5 (c) 8 (d) 10

(25) The solution set of the equation : $4^{x} + 2^{x+1} = 8$ in $\mathbb{R}$ is ....

(a) $\{1\}$ (b) $\{-1\}$ (c) $\{1, -1\}$ (d) $\varnothing$

(26) Δ XYZ is an equilateral triangle of side length = $14\sqrt{3}$ cm. , then length of diameter of circumcircle = ...

(a) 7 (b) 14 (c) 28 (d) 21

(27) $\lim_{x \to 1} (3 - x) =$ ....

(a) 1 (b) 2 (c) 4 (d) – 2

Second | Essay questions

Answer the following questions :

1 Represent the function $f(x) = (x - 2)^3 + 1$ graphically , then from the graph find the domain , its type if it is even , odd or otherwise

2 If $f(x) = \begin{cases} ax - 2 & , -4 \le x \le 3 \\ x^2 + b & , 3 < x < 5 \\ 6x - 1 & , 5 \le x < 7 \end{cases}$ is continuous function on $x \in [-4, 7]$

Find the value of a and b

15 Qena Governorate



Maths Inspection

First | Multiple choice questions

Choose the correct answer from those given :

(1) $\lim_{x \to 0} \frac{x^2 + x}{x} =$ ....

(a) not exist (b) zero (c) 2 (d) 1

(2) The S.S. of the equation : $|x - 2| + 3 = 1$ in $\mathbb{R}$ is ....

(a) $[-2, 2]$ (b) $\varnothing$ (c) $\mathbb{R}$ (d) $[-1, 1]$

(3) In Δ ABC , a = 5 cm. , b = 8 cm. , m ($\angle$ C) = 60° , then c = ...

(a) 4 cm. (b) 7 cm. (c) 8 cm. (d) 9 cm.

(4) The one-to-one function is ....

(a) $f(x) = x - 3$ (b) $f(x) = 2x^2$ (c) $f(x) = |x + 2|$ (d) $f(x) = 4$

(5) $\lim\limits_{x \to -3} \frac{(x+2)^3 + 1}{x + 3} =$ ....

(a) 3 (b) 6 (c) -3 (d) 8

(6) If $\log_2 x = 3$, then $\log_x 8 =$ ....

(a) 2 (b) 1 (c) 3 (d) 4

(7) In Δ XYZ , if $\sin X = 2 \sin Y$, $x = 6$ cm. , then $y =$ .... cm.

(a) 6 (b) 2 (c) 12 (d) 3

(8) The S.S. of the inequality : $|2x - 1| < 3$ is ....

(a) $[-1 , 2]$ (b) $]-1 , 2[$ (c) $\mathbb{R} -]-1 , 2[$ (d) $\mathbb{R} - [-1 , 2]$

(9) In Δ ABC , $2 \sin A \sin B = 3 \sin B \sin C = 4 \sin C \sin A$, then a : b : c = ...

(a) 3 : 4 : 2 (b) 4 : 3 : 2 (c) 6 : 4 : 3 (d) 2 : 3 : 4

(10) If $f(x) = \begin{cases} x + 3 & , x < 2 \\ x^2 - 1 & , x > 2 \end{cases}$, then $(f \circ f)(1) =$ ....

(a) 15 (b) 4 (c) zero (d) 3

(11) $\lim\limits_{x \to 3} \frac{x - 3}{x^2 + 9} =$ ....

(a) not exist (b) zero (c) $\frac{1}{6}$ (d) $\frac{-1}{3}$

(12) The function $f(x) = (x - 1)^3 + 2$ is increasing in the interval ....

(a) $]-\infty , 1]$ (b) $[2 , \infty[$ (c) $[1 , \infty[$ (d) $]-\infty , \infty[$

(13) $\lim\limits_{x \to \infty} \frac{(a-3)x^2 + bx + 7}{2x + 1} = 3$, then a + b = ...

(a) 7 (b) 9 (c) 6 (d) 3

(14) If $4^{x-3} = 7^{6-2x}$, then $x + 2 =$ ....

(a) -1 (b) 5 (c) 3 (d) 2

(15) The number of solutions of triangle ABC where $m(\angle A) = 150°$, a = 12 cm. , b = 15 cm. is ....

(a) 1 (b) 2

(c) zero (d) infinite number of trianlges.

(16) If $(3)^x = 2$, then $(9)^{x+1} =$ ....

(a) 9 (b) 27 (c) 18 (d) 36

(17) $\lim\limits_{x \to \text{zero}} \frac{4x(\cos x + \cos 2x + \cos 3x)}{\sin 2x} =$ ....

(a) zero (b) not exist. (c) 6 (d) 12

(18) The range of the function $f(x) = (x-1)^2$ is ....

(a) $]-\infty, 1]$ (b) $[0, \infty[$ (c) $[1, \infty[$ (d) $[-1, \infty[$

(19) $\lim\limits_{x \to \frac{\pi}{2}} \frac{\sin x}{x} =$ ....

(a) zero (b) $\frac{2}{\pi}$ (c) $\frac{\pi}{2}$ (d) 1

(20) The domain of the function $f(x) = \log x^2$ is ....

(a) $x > 0$ (b) $x > 1$ (c) $\mathbb{R}$ (d) $\mathbb{R} - \{0\}$

(21) In ΔABC, $\sin A + \sin B + \sin C = 2.4$, and its perimeter = 24 cm., then the circumference of the circle passing through the vertices of ΔABC = ... π cm.

(a) 20 (b) 10 (c) 5 (d) 25

(22) If $(5)^{x-4} = \log_c 7 \times \log_7 c$, then $x =$ ....

(a) 4 (b) 1 (c) 5 (d) 11

(23) $\lim\limits_{x \to 3} \frac{\sqrt{x+1}-2}{x-3} =$ ....

(a) not exist (b) zero (c) 4 (d) $\frac{1}{4}$

(24) If $x = \log 2$, $y = \log 3$, then $\log 12 =$ ....

(a) $2x + y$ (b) $6x + y$ (c) $x^2 + y^2$ (d) $6xy$

(25) $\lim\limits_{x \to \infty} (6 + 4x^{-2} - 2x^{-1}) =$ ....

(a) ∞ (b) 8 (c) 6 (d) -2

(26) If $\log_3 x \times \log_5 3 = 2$, then $x =$ ....

(a) 1 (b) 25 (c) 125 (d) 8

(27) In ΔABC, $m(\angle A) = 40°$, $m(\angle B) = 60°$, then the greatest side in length is ....

(a) a (b) b (c) c (d) bc

Second Essay questions

Answer the following questions :

1 Draw the curve of the function $f(x) = |x-2| + 1$, then from the graph find the range, the monotony, its type if it is even, odd or otherwise.

2 Find the value of (c) that makes the function :

$$f(x) = \begin{cases} \frac{(x+1)^9 - 1}{x} &, x < 0 \\ 3x + c &, x \geq 0 \end{cases}$$ is continoues at $x = 0$



كيفية طباعة صفحات معينة من ملف معين



مثلا ازاى نطبع الصفحات من صفحة 4 الى صفحة 9

خطوة 1

خطوة 2 اختيار اسم الطابعة بتاعتك

خطوة 3 كتابة الصفحات المراد طباعتها نكتب رقم 4 ثم نكتب الشرطة دي - ثم نكتب 9

خطوة 4 اختيار نوع الورق

خطوة 5 اختيار A4

خطوة 6

حمل الآن

مجانا وحصريا

امتحانات رقم (2)







1 Cairo Governorate



El-Nozha Educational Zone
Mathematics Supervision

First Multiple choice questions


Interactive test 1

Choose the correct answer from those given :

(1) If $f(2) = 4$, $g(4) = 3$, then $(g \circ f)(2) =$ ....

(a) 12 (b) 4 (c) 3 (d) 1

(2) If $f : f(X) = X^2 + aX + 9$ is even function , then a = ...

(a) zero (b) 3 (c) 6 (d) – 6

(3) The solution set in $\mathbb{R}$ of the the inequality $|X - 1| \geq 3$ is ....

(a) $]-2 , 4[$ (b) $[-2 , 4]$ (c) $\mathbb{R} -]-2 , 4[$ (d) $\mathbb{R} - [-2 , 4]$

(4) In ΔABC : $m(\angle A) = 45°$, and the length of the radius of the circle passing through its vertices = 6 cm. , then a = ... cm.

(a) 13 (b) $6\sqrt{2}$ (c) 12 (d) $\sqrt{2}$

(5) $\lim\limits_{X \to 4} \frac{X^2 - 16}{X - 4} =$ ....

(a) zero (b) 4 (c) 16 (d) 8

(6) The exponential form of the relation $\log_3 y = X$ is ....

(a) $y = X^3$ (b) $X = y^3$ (c) $y = 3^X$ (d) $X = 3^y$

(7) The vertex point of the curve of the function $f : f(X) = (3 - X)^2 + 2$ is ....

(a) $(-3 , -2)$ (b) $(3 , 2)$ (c) $(-3 , 2)$ (d) $(3 , -2)$

(8) The solution set of the equation : $\sqrt{X^2 + 6X + 9} = 5$ in $\mathbb{R}$ is ....

(a) $\{2\}$ (b) $\{-8\}$ (c) $\{-8 , 2\}$ (d) $\varnothing$

(9) $\lim\limits_{X \to 2} \frac{X^5 - 32}{X^3 - 8} =$ ....

(a) 4 (b) $\frac{5}{3}$ (c) zero (d) $6\frac{2}{3}$

(10) In ΔXYZ , if $X = y$, then $\cos X =$ ....

(a) $\frac{z}{2y}$ (b) $\frac{2y}{z}$ (c) $\frac{2z}{X}$ (d) $\frac{y}{2X}$

(11) If $X^{\frac{3}{4}} = 27$, then $X =$ ....

(a) 3 (b) 9 (c) 27 (d) 81

(12) $\lim\limits_{x \to \infty} \frac{2x-5}{3x-7} =$ ....

(a) $\frac{2}{3}$ (b) $\frac{5}{7}$ (c) $\frac{3}{2}$ (d) $\frac{7}{5}$

(13) The range of $f : f(x) = \frac{1}{x-2} + 1$ is ....

(a) $\mathbb{R} - \{1\}$ (b) $\mathbb{R} - \{2\}$ (c) $\mathbb{R} - \{-2\}$ (d) $[2, \infty[$

(14) The solution set of the equation $\log_2 x = \log_4 25$ equal ....

(a) $\{2\}$ (b) $\{5\}$ (c) $\{1, 5\}$ (d) $\{4\}$

(15) $\lim\limits_{x \to 0} \frac{\sin 3x}{x} =$ ....

(a) 1 (b) $\frac{1}{3}$ (c) 3 (d) -3

(16) If $f(x) = 3^{x-2}$, then the solution set of equation $f(x-1) = 81$ is ....

(a) $\{7\}$ (b) $\{5\}$ (c) $\{4\}$ (d) $\{3\}$

(17) $\lim\limits_{x \to 0} \frac{\sin^2 2x + \tan^2 2x}{3x^2} =$ ....

(a) $\frac{2}{3}$ (b) 2 (c) $2\frac{2}{3}$ (d) $\frac{1}{3}$

(18) All the functions defined by the following rules are one to one except ....

(a) $f(x) = x + 2$ (b) $f(x) = x^2, x > 0$

(c) $f(x) = |x|$ (d) $f(x) = \frac{3x-5}{x-2}$

(19) If $f(x) = 2x - 6$, then its inverse function $f^{-1}(x) =$ ....

(a) $2x + 6$ (b) $x + 3$ (c) $2x + 3$ (d) $\frac{1}{2}x + 3$

(20) In Δ ABC : c = 7 cm. , m ($\angle$ A) = 70° , m ($\angle$ B) = 40° , then b $\simeq$ .... cm.

(a) 6.3 (b) 7.93 (c) 3.6 (d) 4.8

(21) $\lim\limits_{x \to \infty} \left(\frac{5}{7}\right)^{\frac{1}{x}} =$ ....

(a) 1 (b) -1 (c) $\frac{3}{5}$ (d) ∞

(22) If $3^{x+1} + 3^{x-1} = 90$, then $x =$ ....

(a) 9 (b) 27 (c) 3 (d) 10

(23) $\lim\limits_{x \to 0} 3x \csc 2x =$ ....

(a) 6 (b) $1\frac{1}{2}$ (c) $\frac{2}{3}$ (d) not available.

(24) The radius length of the circumcircle of an equilateral triangle whose side length is $20\sqrt{3}$ cm. = ...

(a) 5 (b) 10 (c) 20 (d) 40

(25) If $\log_2 3 \times \log_3 4 \times \log_4 5 \times ... \times \log_n (n+1) = 10$, then n = ...

(a) 9 (b) 10 (c) 11 (d) 1023

(26) $\lim\limits_{x \to 3} \frac{\sqrt{x+1}-2}{x-3} =$ ....

(a) 4 (b) $\frac{1}{4}$ (c) 6 (d) $\frac{1}{6}$

(27) The measure of the largest angle in a triangle whose side lengths are 3 cm. , 5 cm. and 7 cm. is ....°

(a) 110 (b) 150 (c) 100 (d) 120

Second Essay questions

Answer the following questions :

1 Draw the curve of the function : $f(x) = |x-2| + 3$, explain from the drawing the range of the function , discuss its monotony and determine its type if it is even , odd or otherwise.

---

2 Discuss the existence of $\lim\limits_{x \to 4} f(x)$ where $f(x) = \begin{cases} \frac{x^2-5x+4}{x-4} & , x > 4 \\ 2x-5 & , x < 4 \end{cases}$

2 Cairo Governorate



Shoubra Eductional Zone
Mathematics Supervision

First Multiple choice questions



Interactive test ②

Choose the correct answer from the given ones :

(1) If $f(x) = x - 3$, $g(x) = x^2$, then $(f \circ g)(5) =$ ....

(a) 2 (b) 4 (c) 22 (d) 25

(2) If $f(x) = 3^x$, then $f(a) \times f(b) =$ ....

(a) $f(a\,b)$ (b) $f(a+b)$ (c) a b (d) a + b

(3) If f is an even function and $7f(x) - 4f(-x) = 9$, then $f(x) =$ ....

(a) – 5 (b) 9 (c) 5 (d) 3

(4) If $\log_3 15 = x$, $\log_2 5 = y$, then ....

(a) $3^{x-1} = 2^y$ (b) $3x = 2y$ (c) $x^3 = y^2$ (d) $x = y$

(5) $\log(\cos\theta) + \log(\sec\theta) =$ .... where $\theta \in [0 , \frac{\pi}{2}[$

(a) – 1 (b) 0 (c) 1 (d) 2

(6) If $\lim_{x \to a} \frac{x^5 - a^5}{x^4 - a^4} = 1$, then a = ...

(a) $\frac{4}{5}$ (b) $\frac{5}{4}$ (c) 4 (d) 5

(7) $\lim_{x \to 0} \frac{\sin 3x}{\tan \frac{1}{3} x} =$ ....

(a) $\frac{1}{2}$ (b) 1 (c) 3 (d) 9

(8) The number of triangle which satisfy : m (∠ A) = 50° , a = 4 cm. , b = 7 cm. equals ....

(a) 0 (b) 1 (c) 2 (d) ∞

(9) If Δ ABC is an equilateral triangle its perimeter = $18\sqrt{3}$ cm. , then the radius length of its circumcircle = ... cm.

(a) 12 (b) $6\sqrt{3}$ (c) 6 (d) 3

(10) If $\log_5 x = 3$, then $\log_5 \left(\frac{x}{5}\right) =$ ....

(a) 3 (b) 2 (c) 125 (d) 25

(11) The function $f(x) = 3 - |x - 1|$ is increasing on ....

(a)]3 , ∞[(b)]− ∞ , 3[(c)]1 , ∞[(d)]− ∞ , 1[

(12) The solution set of the inequality : $|x + 3| + 2 < 1$ in ℝ is ....

(a) [− 4 , − 2] (b)]− 4 , − 2[(c) ∅ (d) {− 4 , − 2}

(13) $\log_b a^2 \times \log_c b \times \log_d c \times \log_a d =$ ....

(a) 2 (b) 3 (c) 4 (d) 5

(14) $\lim_{x \to 0} (3 a^2) =$ ....

(a) 0 (b) $3 a^2$ (c) 1 (d) 3

(15) $\lim_{x \to 16} \frac{\sqrt{x} - 1}{x - 16} =$ ....

(a) $\frac{1}{2}$ (b) 1 (c) doesn't exist (d) 0

(16) $\lim_{x \to \infty} \frac{\sqrt[x]{5}}{10} =$ ....

(a) − ∞ (b) ∞ (c) $\frac{1}{2}$ (d) $\frac{1}{10}$

(17) In Δ ABC : if a = b , then cos A = ...

(a) $\frac{2c}{b}$ (b) $\frac{c}{2b}$ (c) $\frac{2b}{a}$ (d) $\frac{2b}{c}$

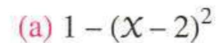
(18) In Δ ABC : a : b : c = 3 : 2 : 2 , then cos A = ...

(a) $\frac{1}{3}$ (b) $\frac{1}{2}$ (c) $\frac{-1}{8}$ (d) $\frac{3}{4}$

(19) In the opposite figure :

The shown curve represents the function

$f(x) =$ ....

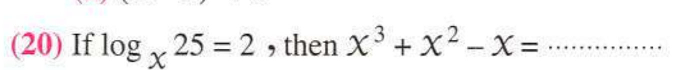


(a) $1-(x-2)^2$

(b) $2-(x-1)^2$

(c) $(x-2)^2+1$

(d) $(x-1)^2+2$



(20) If $\log_x 25 = 2$, then $x^3 + x^2 - x =$ ....

(a) 105 (b) 95 (c) 155 (d) 145

(21) The solution set of the equation : $\log_x 4x = 3$ is ....

(a) $\{0, 2\}$ (b) $\{0, -2\}$ (c) $\{2\}$ (d) $\{0, 2, -2\}$

(22) If $5^x = 2$, then $5^{x+2} =$ ....

(a) 25 (b) 50 (c) 4 (d) 10

(23) $\lim\limits_{x \to 3} \frac{x^2 - x - 6}{x^2 + x - 12} =$ ....

(a) -1 (b) -5 (c) $\frac{1}{7}$ (d) $\frac{5}{7}$

(24) $\lim\limits_{x \to 5} \frac{x^2 - 5x}{\sqrt{x+4} - 3} =$ ....

(a) 30 (b) 25 (c) 6 (d) 5

(25) $\lim\limits_{x \to 0} \frac{(x+1)^2 - 1}{x} =$ ....

(a) -4 (b) 4 (c) -3 (d) -2

(26) In Δ ABC if AB = AC = 8 cm. , m ($\angle$ A) = 120° , then the radius length of its circumcircle = ... cm.

(a) 8 (b) 16 (c) 4 (d) $4\sqrt{3}$

(27) In Δ ABC : cos A = ...

(a) cos B – cos C (b) cos (B + C)

(c) – (cos B + cos C) (d) – cos (B + C)

Second Essay questions

Answer the following questions :

1 Find the solution set of the equation : $2|2-x| + 3\sqrt{x^2 - 4x + 4} = 15$ in $\mathbb{R}$

2 Discuss the continuity of the function f in $\mathbb{R}$ where : $f(x) = \begin{cases} \frac{\sin(x-1)}{x-1} & , \quad x > 1 \\ -\cos \pi x & , \quad x \le 1 \end{cases}$

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First Multiple choice questions


Interactive test ③

Choose the correct answer from those given :

(1) ABC is right-angled triangle at B and b = 12 cm. , then $\frac{a}{\sin A} + \frac{c}{\sin C} =$ .... cm.

(a) 6 (b) 12 (c) 24 (d) 36

(2) If $2^{x} = 5$, then $x =$ ....

(a) $\log_2 5$ (b) $\log_5 2$ (c) $\log \frac{5}{2}$ (d) $\log_2 10$

(3) In Δ ABC , a = 5 cm. , b = 3 cm. and m ($\angle$ C) = 120° , then the perimeter of Δ ABC = ... cm.

(a) 7 (b) 15 (c) 13 (d) 11

(4) If $\lim_{x \to 1} \left(\frac{x^2 + 3x - 4}{x + a} \right) = 5$, then a = ...

(a) 7 (b) – 1 (c) 4 (d) 2

(5) If $\sqrt{2} \times \sqrt[3]{2} = \sqrt[6]{a}$, then a = ...

(a) 16 (b) 24 (c) 32 (d) 64

(6) $\lim_{x \to \infty} (1 + x - x^2) =$ ....

(a) zero (b) ∞ (c) 1 (d) $-\infty$

(7) If $f(x) = 3x - 1$, then $(f \circ f)(1) =$ ....

(a) 2 (b) 3 (c) 4 (d) 5

(8) If the function f is even , $f(2) = c$, $f(-2) = 6 - c$, then c = ...

(a) 1 (b) 2 (c) 3 (d) 6

(9) If $1 < x < 5$, which of them is true ?

(a) $|x| > 2$ (b) $|x| < 2$ (c) $|x - 3| < 2$ (d) $|x - 3| > 2$

(10) The solution set of the equation in $\mathbb{R}$: $x - 15 = 2\sqrt{x}$ is ....

(a) {25} (b) {9} (c) {25 , 9} (d) {5 , 3}

(11) If the function is continuous in $\mathbb{R}$, $\lim_{x \to 1^+} f(x) = L$ and $\lim_{x \to 1^-} f(x) = M$, then $(L - M)^2 =$ ....

(a) zero (b) LM (c) 2 L (d) 1

(12) The triangle XYZ in which $x = y$, then $z^2 =$ .... $(1 - \cos z)$

(a) y (b) 2 y (c) y^2 (d) $2y^2$

(13) If $\log_{x} 25 = 2$, then $x =$ ....

(a) -5 (b) 5 (c) ± 5 (d) $\pm\sqrt{5}$

(14) The triangle ABC in which $\frac{3a}{\sin A} = 18$ cm. , then the area of circumcircle of $\Delta ABC =$ .... cm.^{2}

(a) 3π (b) 6π (c) 9π (d) 18π

(15) If the function $f(x) = 2x - k$ and $(1, 3) \in f^{-1}$, then k = ...

(a) -1 (b) 5 (c) 4 (d) 7

(16) $\lim_{x \to 2} \frac{\sin(x-2)}{3x-6} =$ ....

(a) $\frac{1}{3}$ (b) $\frac{1}{2}$ (c) $\frac{1}{4}$ (d) $\frac{2}{3}$

(17) The number of cows in a cattle farm is 80 cows and the production rate of these cows is 18 % annually , then the number of cows after 4 years is .... cows.

(a) 125 (b) 135 (c) 145 (d) 155

(18) $\lim_{x \to a} \frac{x^3 - a^3}{x - a} = 12$, then a = ...

(a) ± 2 (b) ± 4 (c) 2 (d) -2

(19) **In the opposite figure :**

If $AD = 4\sqrt{2}$ cm.

, then BC = ... cm.

A
$4\sqrt{2}$
45°
D
B
30°
C

(a) 2 (b) 4

(c) $4\sqrt{2}$ (d) 8

(20) If ΔABC , $(c)^2 = (a+b)^2 - ab$, then $m(\angle C) =$ ....°

(a) 30 (b) 45 (c) 60 (d) 120

(21) If $\lim_{x \to \infty} \frac{kx + 5}{2x - 3} = 4$, then k = ...

(a) 8 (b) 6 (c) 4 (d) 10

(22) If the function $f(x) = (a-1)^x$ is exponential function , then ....

(a) $a \in \mathbb{R}^+ - \{1\}$ (b) $a \in \mathbb{R}^+ - \{2\}$

(c) $a \in \mathbb{R}^+$ (d) $a \in]1, \infty[- \{2\}$

(23) $\lim_{x \to 0} [x \csc(2x)] =$ ....

(a) 1 (b) 2 (c) $\frac{1}{2}$ (d) -1

(24) If $f(X) = \begin{cases} X^2 + 1 & , X > 2 \\ 3X - 1 & , X \leq 2 \end{cases}$, then $\lim\limits_{X \to 2} f(X) =$ ....

(a) 2 (b) 3 (c) 5 (d) not exist

(25) The solution set of the inequality : $\frac{1}{|X|} \geq \frac{1}{2}$ in $\mathbb{R}$ is ....

(a) $[-2, 2]$ (b) $[-2, 2] - \{0\}$ (c) $\mathbb{R} -]-2, 2[$ (d) $\varnothing$

(26) The solution set of the equation : $2|X| - 3 = |X|$ in $\mathbb{R}$ is ....

(a) 3 (b) $\varnothing$ (c) -3 (d) ± 3

(27) If $2^X = 3^y = 5^z$, then $\frac{X}{y} + \frac{X}{z} =$ ....

(a) log 15 (b) $\log_3 15$ (c) $\log_5 15$ (d) $\log_2 15$

Second Essay questions

Answer the following questions :

1 **The solution set of the equation :** $5X - 2|X| = 21$ in $\mathbb{R}$

2 If $f(X) = \begin{cases} \frac{\sqrt{X+3} - 2}{X - 1} & , X \neq 1 \\ a & , X = 1 \end{cases}$ continuous at $X = 1$ find the value of a

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Mathematics Inspection

First Multiple choice questions



Interactive test (4)

Choose the correct answer from those given :

(1) The sum of roots of the equation : $X^4 = 16$ equals ....

(a) 2 (b) -2 (c) zero (d) ± 2

(2) If L , M are the roots of the equation : $3X^2 - 16X + 12 = 0$, then $\log_2 L + \log_2 M =$ ....

(a) 2 (b) 4 (c) 12 (d) 16

(3) If $y = \sqrt[5]{X}$, then its inverse function is y = ...

(a) $\frac{1}{5}X^5$ (b) X^5 (c) $X^5 - 1$ (d) $5X^5$

(4) The domain of the function $f(X) = \frac{\sqrt{X-2}}{X-3}$ is ....

(a) $[2, \infty[- \{3\}$ (b) $[2, \infty[$ (c) $\{3\}$ (d) $\mathbb{R}$

(5) The vertex of the curve of : $f(X) = (2 - X)^2 + 3$ is ....

(a) (2 , 3) (b) (2 , −3) (c) (−2 , 3) (d) (−2 , −3)

(6) If $3^a = 4^b$, then $(9)^{\frac{a}{b}} + (16)^{\frac{b}{a}} =$ ....

(a) 7 (b) 12 (c) 20 (d) 25

(7) If $f(X) = 4X - 5$, $g(X) = 3^X$, then $(f \circ g)(2) =$ ....

(a) 32 (b) 9 (c) 27 (d) 31

(8) The solution set of the inequality : $|X - 1| < -2$ is ....

(a) $]-1, 3[$ (b) $\mathbb{R} - [-1, 3]$ (c) $\varnothing$ (d) $]-2, 2[$

(9) If f is an even and $f(X) + X^2 f(-X) = 3$, then $f(2) =$ ....

(a) 5 (b) $\frac{3}{4}$ (c) $\frac{3}{5}$ (d) 2

(10) In Δ ABC, if a = 4 cm., b = 5 cm., $\cos C = \frac{2}{5}$, then c = ... cm.

(a) 4 (b) 5 (c) 2.5 (d) 8

(11) In Δ XYZ, if 2 m ($\angle$ X) = 3 m ($\angle$ Y) = 6 m ($\angle$ Z), X = 8 cm., then z = ... cm.

(a) 8 (b) 16 (c) 4 (d) 5

(12) ABC is a triangle drawn in the unit circle, then $\frac{a}{\sin A} =$ ....

(a) 1 (b) 2 (c) 2π (d) 3

(13) The solution set of $\log_b (X + 5) = \log_b X + \log_b 5$ in $\mathbb{R}$ is ....

(a) $\{5\}$ (b) $\{4\}$ (c) $\{\frac{5}{4}\}$ (d) $\{\frac{4}{5}\}$

(14) In Δ ABC, if $b^2 = a^2 + c^2 - ac$, then m ($\angle$ B) = ...°

(a) 45 (b) 30 (c) 60 (d) 90

(15) If r is the radius of circumcircle of a triangle, then a + 2 r sin B + c = ...

(a) circumference of circle. (b) area of circle.

(c) perimeter of Δ ABC (d) area of Δ ABC

(16) The range of the function $f : f(X) = \frac{X - 2}{2 - X}$ is ....

(a) $\mathbb{R}$ (b) $\mathbb{R} - \{2\}$ (c) $\{-1\}$ (d) $\mathbb{R} - \{-2\}$

(17) If $4^X = 3$, $8^y = 9$, then $\frac{X + y}{X - y} =$ ....

(a) -7 (b) 7 (c) $\frac{1}{3}$ (d) $\frac{1}{2}$

(18) The domain of the function $f : f(X) = \log_{X+3} 6 - X$ is ....

(a) $]-3, 6[$ (b) $[3, 6[$

(c) $]-3, 6[- \{-2\}$ (d) $]3, 6[- \{5\}$

(19) $\lim\limits_{x \to 1} \dfrac{x^{9\frac{1}{2}} - x^{\frac{1}{2}}}{x^{3\frac{1}{2}} - x^{\frac{1}{2}}} = \dots\dots$

(a) $\frac{19}{7}$ (b) 3 (c) 1 (d) x

(20) $\lim\limits_{x \to 2} \dfrac{x^2 - 4a}{x - 2}$ exist , then a = ……

(a) – 1 (b) 1 (c) 2 (d) 4

(21) $\lim\limits_{x \to 2} \left(\dfrac{x^5 - 32}{x + 2} \right) = \dots\dots$

(a) 0 (b) 80 (c) 32 (d) 2

(22) The perimeter of Δ ABC = 24 cm. and sin A + sin C = 3 sin B , then b = …… cm.

(a) 4 (b) 9 (c) 6 (d) 8

(23) $\lim\limits_{x \to \infty} \dfrac{x^{-3} + x^{-2} + 8}{2 - x^{-4} + x^{-3}} = \dots\dots$

(a) 1 (b) 4 (c) ∞ (d) $-\infty$

(24) $\lim\limits_{x \to \pi} \left(\dfrac{\sin 3x}{x} \right) = \dots\dots$

(a) 3 (b) 3π (c) π (d) zero

(25) $\lim\limits_{x \to 3} \dfrac{x^2 - 9}{\tan(2x - 6)} = \dots\dots$

(a) 1 (b) 3 (c) 2 (d) 5

(26) If $f(x) = \begin{cases} x^2 + 3a & , x > 2 \\ 5x + b & , x \le 2 \end{cases}$ and $\lim\limits_{x \to 2} f(x) = 7$, then a + b = ……

(a) 1 (b) – 3 (c) – 2 (d) 3

(27) If $\lim\limits_{x \to \infty} \dfrac{3k|x|}{4x + 3} = 6$, then k = ……

(a) 6 (b) $\frac{3}{4}$ (c) 8 (d) 3

Second Essay questions

Answer the following questions :

1 **Find the solution set of the following inequality in $\mathbb{R}$:** $\sqrt{9x^2 - 6x + 1} > 7$

2 **Discuss the continuity of the function f where :** $f(x) = \begin{cases} 4x - 1 & , x \le 1 \\ x^2 + 2 & , x > 1 \end{cases}$ at $x = 1$

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Mathematics Inspection



Interactive test (5)

First Multiple choice questions

Choose the correct answer from those given :

(1) The vertex of the curve of the function $f(X) = (X-1)^2 - 2$ is the point ....

(a) $(1, 2)$ (b) $(-1, 2)$ (c) $(1, -2)$ (d) $(-1, -2)$

(2) $\lim\limits_{X \to \infty} \frac{2X^2 - 4}{3X - 5X^2 + 6} =$ ....

(a) $\frac{2}{3}$ (b) $\frac{-2}{5}$ (c) $\frac{2}{5}$ (d) $\frac{-4}{5}$

(3) If $3^{2X-1} = 27$, then $X =$ ....

(a) 2 (b) -2 (c) -5 (d) 5

(4) ABC is a triangle in which a : b : c = 3 : 4 : 5, then m ($\angle$ C) = ...°

(a) 30 (b) 45 (c) 60 (d) 90

(5) $\lim\limits_{X \to 0} \frac{3 - 2X}{\cos 7X} =$ ....

(a) 1 (b) $\frac{1}{7}$ (c) -2 (d) 3

(6) The function $f : f(X) = X^2 \sin X$ is .... function.

(a) linear (b) neither even nor odd

(c) odd (d) even

(7) The S.S. of the equation : $\log_X (X + 6) = 2$ in $\mathbb{R}$ is ....

(a) $\{3, -2\}$ (b) $\{3\}$ (c) $\{3, 1\}$ (d) $\{1, 6\}$

(8) ABC is a triangle in which m ($\angle$ B) = 60°, m ($\angle$ A) = 40° and b = 8 cm.
, then c $\simeq$ .... cm.

(a) 9 (b) 8 (c) 7 (d) 6

(9) The line of symmetry of the function $f(X) = |2X - 2| + 3$ is ....

(a) $X = 2$ (b) $X = -2$ (c) $X = 3$ (d) $X = 1$

(10) $\lim\limits_{X \to \infty} (X^{-3} - 5X^{-2} + 2) =$ ....

(a) 2 (b) ∞ (c) $-\infty$ (d) does not exist

(11) If $f(X) = 2^X$, then the S.S. of the equation : $f(2X) - 6f(X) + 8 = 0$ in $\mathbb{R}$ is ....

(a) $\{1\}$ (b) $\{2\}$ (c) $\{1, 2\}$ (d) $\varnothing$

(12) ABC is a triangle in which $\frac{a}{\sin A} = 6$, then the circumference of the circumcircle of the triangle = ...

(a) 6π (b) 3π (c) 12π (d) 9π

(13) The S.S. of the inequality : $|2x - 1| \le 5$ in $\mathbb{R}$ is ....

(a) $]-2 , 3[$ (b) $\{-2 , 3\}$ (c) $\mathbb{R} -]-2 , 3[$ (d) $[-2 , 3]$

(14) In the opposite figure :

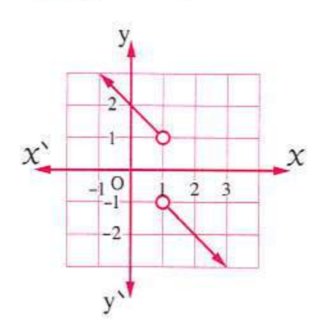
$\lim_{x \to 1} f(x) =$ ....

(a) does not exist.

(b) 1

(c) 2

(d) -1



(15) $\lim_{x \to 0} \frac{1 - \cos x + \sin x}{1 - \cos x + \tan x} =$ ....

(a) zero (b) 1 (c) 2 (d) does not exist.

(16) If $f(x) = x + 1$ and $g(x) = x^2$, then $(f \circ g)(2) =$ ....

(a) 1 (b) 2 (c) 4 (d) 5

(17) ABC is a triangle in which : a = 3 cm. , b = 5 cm. , m (∠ C) = 75° , then the surface area of triangle ABC ≃ .... cm.^{2}

(a) 6 (b) 7 (c) 8 (d) 9

(18) If $f(x) = 3^{x-2}$, then the S.S. of the equation : $f(x-1) = 81$ in $\mathbb{R}$ is ....

(a) $\{7\}$ (b) $\{5\}$ (c) $\{4\}$ (d) $\{3\}$

(19) If $y = x^3$ is the curve of a real function , and g is its image by a translation 2 units to the right , then $g(x) =$ ....

(a) $(x + 2)^3$ (b) $(x - 2)^3$ (c) $x^3 + 2$ (d) $x^3 - 2$

(20) $\lim_{h \to 0} \frac{(x + h)^6 - x^6}{h} =$ ....

(a) 6 (b) x^5 (c) $6x^5$ (d) does not exist.

(21) In triangle DEF : $e^2 + f^2 - d^2 = 2ef$ ....

(a) cos D (b) cos E (c) sin D (d) cos F

(22) If $5^{x-3} = 7^{x-3}$, then $x =$ ....

(a) 5 (b) 7 (c) 3 (d) zero

(23) If $\lim_{x \to 1} \frac{x^2 + 3x - 4}{x + a} = 5$, then a = ...

(a) zero (b) -1 (c) 1 (d) 4

(24) The domain of the function $f(X) = \sqrt{X-5}$ is ....

(a) $\mathbb{R}$ (b) $]-5, \infty[$ (c) $]-\infty, 5[$ (d) $[5, \infty[$

(25) $\lim\limits_{X \to \infty} \frac{(X^2+2X)(6X^3+1)}{(X^4-1)(2X-3)} =$ ....

(a) 1 (b) 3 (c) 6 (d) -5

(26) In triangle ABC : if 3 sin A = 2 sin B = 4 sin C , then a : b : c = ...

(a) 4 : 6 : 3 (b) 3 : 4 : 6 (c) 6 : 4 : 3 (d) 3 : 2 : 4

(27) $\log_X y \times \log_y z \times \log_z X =$ ....

(a) $X y z$ (b) log 1 (c) log 10 (d) $X + y + z$

Second Essay questions

Answer the following questions :

1 Draw the curve of the function $f(X) = 2 - (X-1)^2$ and from the graph find its monotony and discuss its type for being even , odd or neither even nor odd.

2 If $a \in \mathbb{R}$ and $\lim\limits_{X \to \infty} \frac{(a+1)X^3 - 6X^2 + 4}{2X^2 + 5X - 1} = -3$, then find the value of a

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Math Inspection

First Multiple choice questions



Interactive test 6

Choose the correct answer from those given :

(1) If $f(1) = 3$, $g(3) = 5$, then $(g \circ f)(1) =$ ....

(a) 3 (b) 5 (c) 15 (d) $\frac{3}{5}$

(2) If the function $f : f(X)$ in one-to-one function , $f(2k+3) = f(k-1)$, then k = ...

(a) -1 (b) -2 (c) -3 (d) -4

(3) If the function f is even in $[c , d]$, then c + d = ...

(a) 2 c (b) 2 d (c) c − d (d) zero

(4) The solution set of the inequality $|3X - 2| \geq 4$ in $\mathbb{R}$ is ....

(a) $\mathbb{R} -]\frac{-2}{3}, 2[$ (b) $]\frac{-2}{3}, 2[$ (c) $\mathbb{R} - [\frac{-2}{3}, 2]$ (d) $[\frac{-2}{3}, 2]$

(5) The function $f : f(X) = \begin{cases} X^2 & , X > 2 \\ -X^2 & , X \leq 2 \end{cases}$ is decreasing on the interval ....

(a) $]0, 2[$ (b) $]-\infty, 0[$ (c) $\mathbb{R} - [0, 2]$ (d) $]0, \infty[$

(6) If $x^{\frac{3}{2}} = 8$, then $x =$ ....

(a) 2 (b) 4 (c) 8 (d) 9

(7) If $5^{x} = 2$, then $(25)^{x} =$ ....

(a) 10 (b) 625 (c) 4 (d) 2

(8) If $f : f(x) = a^{x}$ is an exponential function , then $a \in$ ....

(a) $\mathbb{R}$ (b) $\mathbb{R}^{+}$ (c) $\mathbb{R}^{-}$ (d) $\mathbb{R}^{+} - \{1\}$

(9) If $f(x) = \sqrt[5]{x}$, then the inverse function $f^{-1}(x) =$ ....

(a) $\frac{1}{5} x^{5}$ (b) x^{5} (c) $x^{5} - 1$ (d) $5 x^{5}$

(10) If the function $f = \{(1 , 4) , (2 , -3) , (3 , 1) , (4 , 0)\}$, then $f^{-1}(1) + f(2) =$ ....

(a) -1 (b) zero (c) 1 (d) 3

(11) The solution set of the equation $\log_{x}(x + 6) = 2$ in $\mathbb{R}$ is ....

(a) $\{3 , -2\}$ (b) $\{3\}$ (c) $\{3 , 1\}$ (d) $\{6 , 1\}$

(12) The numerical value of the expression $\frac{\log 64}{\log 8} =$ ....

(a) 2 (b) 8 (c) 80 (d) 72

(13) If $3^{x} = 5$, then $x =$ ....

(a) 3 (b) $\log_{3} 5$ (c) $\log_{5} 3$ (d) $\frac{5}{3}$

(14) $\lim\limits_{x \to \infty} \frac{3 k x}{4 x + 3} = 6$, then $k =$ ....

(a) 6 (b) $\frac{3}{4}$ (c) 8 (d) 3

(15) $\lim\limits_{x \to 0} \frac{2 x}{\sin 3 x} =$ ....

(a) $\frac{2}{3}$ (b) $\frac{3}{2}$ (c) 6 (d) not exist.

(16) $\lim\limits_{x \to 0} \frac{1 - \cos x + \tan 5 x}{1 - \cos x - \tan x} =$ ....

(a) -5 (b) 5 (c) zero (d) undefined

(17) $\lim\limits_{x \to 5} \frac{x^{2} - 5 x}{\sqrt{x + 4} - 3} =$ ....

(a) 30 (b) 6 (c) 5 (d) 25

(18) $\lim\limits_{x \to 1} \frac{x^{2} - k^{2}}{x + 2} = -1$, then $k =$ ....

(a) 2 (b) -2 (c) 4 (d) ± 2

(19) $\lim\limits_{x \to \infty} \frac{\sqrt[3]{64 x^{3} + 7 x - 2}}{3 x + 2} =$ ....

(a) 4 (b) 3 (c) $\frac{2}{3}$ (d) $\frac{4}{3}$

(20) $\lim\limits_{h \to 0} \frac{(3h-1)^5+1}{5h} =$ ....

(a) -3 (b) $\frac{3}{5}$ (c) 3 (d) 5

(21) If the function $f(x) = \begin{cases} 2x & , x \le 1 \\ 3x - a & , x > 1 \end{cases}$ is continuous at $x = 1$, then a = ...

(a) 1 (b) 2 (c) -1 (d) -2

(22) In Δ ABC , m ($\angle$ A) : m ($\angle$ B) : m ($\angle$ C) = 3 : 4 : 3 if a = 5 cm. , then the circumference of the circle passing through the vertices of Δ ABC $\simeq$ .... cm.

(a) 17 (b) 18 (c) 19 (d) 15

(23) The number of possible solution of Δ XYZ in which $x = 5$ cm. , y = 6 cm. , m ($\angle$ X) = 70° equals ....

(a) zero (b) 2 (c) 1 (d) 3

(24) The perimeter of Δ ABC = 33 cm. and sin A + sin C = $\frac{2}{3}$, sin B = $\frac{1}{4}$, then b = ...

(a) 6 (b) 9 (c) 12 (d) 15

(25) In Δ ABC , if 4 sin A = 3 sin B = 6 sin C , then m ($\angle$ C) $\simeq$ ....

(a) 89° (b) 29° (c) 57° (d) 82°

(26) In Δ ABC , cos (A + B) = ...

(a) $\frac{a^2+b^2-c^2}{2ab}$ (b) $\frac{a^2+c^2-b^2}{2ab}$ (c) $\frac{b^2+c^2-a^2}{2bc}$ (d) $\frac{c^2-a^2-b^2}{2ab}$

(27) The perimeter of Δ ABC in which b = 11 cm. , m ($\angle$ A) = 67° , m ($\angle$ C) = 46° is .... to nearest cm.

(a) 22 (b) 38 (c) 31 (d) 27

Second Essay questions

Answer the following questions :

1 Graph the following function : $f(x) = \frac{1}{x-2} + 3$, then determine its domain and range.

2 If $f(x) = \begin{cases} \frac{x^2-7x+12}{x-3} & , x > 3 \\ 2x - 7 & , x < 3 \end{cases}$ discuss the existence of $\lim\limits_{x \to 3} f(x)$

7 **El-Kalyoubia Governorate**  **Mathematics supervision**

First Multiple choice questions


Interactive test 7

Choose the correct answer from those given :

(1) The domain of the function $f(X) = \sqrt{5 - X}$ is ....

(a) $\{5\}$ (b) $\mathbb{R} - \{5\}$ (c) $]5, \infty[$ (d) $]-\infty, 5]$

(2) The solution set of the inequality : $\sqrt{4X^2 - 12X + 9} \le 5$ in $\mathbb{R}$ is ....

(a) $[-1, 4]$ (b) $[-4, 1]$ (c) $[-1, 4[$ (d) $]-4, 1]$

(3) If f is an even function , $3f(a) + 2f(-a) = 20$, then $f(a) =$ ....

(a) 2 (b) 3 (c) 4 (d) 5

(4) the range of the function $\frac{6X - 5}{3X - 2} =$ ....

(a) $\mathbb{R} - \left\{\frac{2}{3}\right\}$ (b) $\mathbb{R} - \{3\}$ (c) $\mathbb{R} - \left\{\frac{5}{6}\right\}$ (d) $\mathbb{R} - \{2\}$

(5) If $f(X) = 3X - 1$ and $(f + g)(X) = (f \circ g)(X)$, then $g(6) =$ ....

(a) 3 (b) 6 (c) 9 (d) 12

(6) The domain of the function $f : f(X) = \log_3 (X - 5)$ is ....

(a) $]-\infty, 5[$ (b) $]-\infty, 5]$ (c) $]5, \infty[$ (d) $]-\infty, 3]$

(7) If $2^X = 3$, then $8^X =$ ....

(a) 9 (b) 27 (c) 64 (d) 512

(8) If $f(X) = 3^X$, then the solution set of the equation : $f(X + 2) + f(X) = 90$ is ....

(a) $\{1\}$ (b) $\{2\}$ (c) $\{3\}$ (d) $\{4\}$

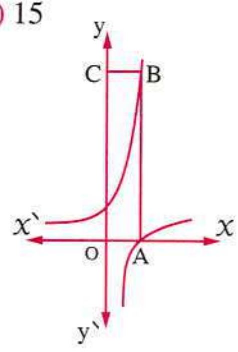
(9) If $\log_3 (X + 1) = 2$, then $X =$ ....

(a) 5 (b) 6 (c) 7 (d) 8

(10) If $X^{\frac{3}{5}} = 27$, then $X =$ ....

(a) 243 (b) 125 (c) 81 (d) 15

(11) In the opposite figure :



$f(X) = 3^X + 1$

, then the area of the rectangle

ABCO = ... area unit.

(a) 12 (b) 18

(c) 20 (d) 24

(12) In the opposite figure :

$\overline{AC}$ is a tangent to the circle M at C

, $A \in \overrightarrow{BD}$, m (∠ B) = 30°

, BC = x cm. , DA = y cm.

, then $\log_3 \frac{x}{y} =$ ....

(a) 3 (b) $\frac{1}{3}$ (c) $\frac{1}{2}$ (d) 2

(13) If $5^{x} \times 2^{y} = 50$, $2^{x} \times 5^{y} = 20$, then $x + y =$ ....

(a) 2 (b) 3 (c) 5 (d) 6

(14) $\lim\limits_{x \to \frac{\pi}{4}} \frac{\tan x}{x} =$ ....

(a) 1 (b) $\frac{\pi}{4}$ (c) $\frac{4}{\pi}$ (d) $\frac{1}{180}$

(15) $\lim\limits_{x \to -1} \frac{x^9 + 1}{x^7 + 1} =$ ....

(a) $\frac{9}{7}$ (b) $\frac{-9}{7}$ (c) $\frac{18}{7}$ (d) $\frac{-18}{7}$

(16) $\lim\limits_{x \to \infty} \frac{2x + 3}{\sqrt{25x^2 + 4}} =$ ....

(a) $\frac{3}{4}$ (b) $\frac{2}{25}$ (c) $\frac{2}{5}$ (d) $\frac{5}{7}$

(17) If $\lim\limits_{x \to \infty} \frac{(a-2)x^3 + bx^2 + 5}{3x^2 + 2} = 4$, then $\frac{b}{a} =$ ....

(a) 4 (b) 6 (c) $\frac{1}{4}$ (d) $\frac{1}{6}$

(18) If $f(x) = \begin{cases} \frac{(x+3)^5 - 243}{5x} & , \quad x \neq 0 \\ 3k & , \quad x = 0 \end{cases}$ is continuous at $x = 0$, then k = ...

(a) 135 (b) 81 (c) 15 (d) 27

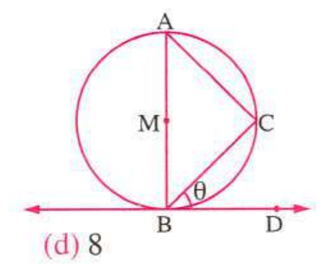
(19) $\lim\limits_{x \to 0} \frac{x^5 - 32}{x^3 - 8} =$ ....

(a) $\frac{20}{3}$ (b) 20 (c) 24 (d) 4

(20) $\lim\limits_{x \to 1} \frac{\sqrt{x + 15} - 4}{x^2 - 1} =$ ....

(a) 4 (b) – 4 (c) $\frac{1}{16}$ (d) $\frac{1}{8}$

(21) In the opposite figure :



$\overline{AB}$ is a diameter in a circle its radius length 2 cm.

, $\overleftrightarrow{BD}$ is a tangent to the circle at B

, m (∠ DBC) = θ° , then $\lim\limits_{\theta \to 0} \frac{BC}{\tan 2\theta} =$ ....

(a) 1 (b) 2 (c) 4 (d) 8

(22) The perimeter of Δ ABC is 15 cm. and sin A + sin C = 2 sin B , then AC = ... cm.

(a) 3 (b) 4 (c) 5 (d) 6

(23) In Δ ABC : AB = 10 cm. , AC = 12 cm. and cos (B + C) = $\frac{1}{3}$, then the length of $\overline{BC}$ = ... cm.

(a) 16 (b) 17 (c) 18 (d) 19

(24) The area of Δ ABC is 10 cm.^{2} and AB = $5\sqrt{2}$ cm. , AC = 4 cm.
, then m ($\angle$ A) may be equal ....°

(a) 15 (b) 30 (c) 45 (d) 60

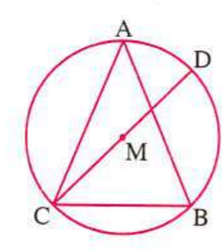
(25) In Δ ABC : AB = 6 cm. , AC = 14 cm. , m ($\angle$ B) = 120° , then the number of triangles which satisfy these conditions is ....

(a) 0 (b) 1 (c) 2 (d) 3

(26) In Δ ABC : $\frac{b^3 - c^3 + a^3}{a^2} = b - c + a$, then m ($\angle$ A) = ...

(a) 60 (b) 90 (c) 120 (d) 150

(27) **In the opposite figure :**



$\angle$ A is acute angle , where sin A = $\frac{1}{3}$
, BC = 6 cm. , then cos ($\angle$ DCB) = ...

(a) $\frac{1}{2}$ (b) $\frac{1}{3}$

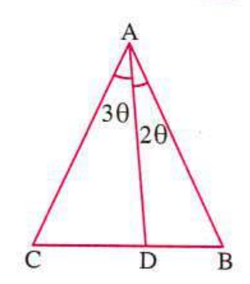
(c) $\frac{1}{4}$ (d) $\frac{1}{6}$

Second Essay questions

Answer the following questions :

1 **Find the solution set of the equation :** $|x - 4| + |x - 3| = 5$ algebraically in $\mathbb{R}$

2 **In the opposite figure :**



In Δ ABC :

3 AC = 5 AB

Find : $\lim_{\theta \to 0} \frac{\text{area of } \Delta ACD}{\text{area of } \Delta ABD}$

8 El-Monofia Governorate



Menouf Educational Administration
Mathematics Directorate

First Multiple choice questions



Choose the correct answer from those given :

(1) The domain of the function $f(X) = \sqrt{X - 4}$ is ....

(a) $[4, \infty[$ (b) $]-\infty, 4[$ (c) $]4, \infty[$ (d) $]-\infty, 4]$

(2) If $f(X) = \sqrt{X + 5}$, $g(X) = X^2$, then $(f \circ g)(2) =$ ....

(a) 3 (b) 4 (c) 7 (d) 9

(3) The function $f(X) = X \cos X$ is ....

(a) even. (b) odd.

(c) neither even nor odd function (d) one-to-one

(4) The symmetric point of the function $f : f(X) = \frac{1}{X} + 1$ is ....

(a) $(1, 0)$ (b) $(0, 1)$ (c) $(0, 0)$ (d) $(1, -1)$

(5) The range of the function $f(X) = |X - 2| + 1$ is ....

(a) $[1, \infty[$ (b) $[2, \infty[$ (c) $]-\infty, 1]$ (d) $[-\infty, 2]$

(6) The solution set of the equation : $3^{X+1} + 3^X = 12$ in $\mathbb{R}$ is ....

(a) $\{0\}$ (b) $\{1\}$ (c) $\{3\}$ (d) $\{0, 1\}$

(7) The exponential function of base (a) is increasing if ....

(a) $a > 0$ (b) $a > 1$ (c) $0 < a < 1$ (d) $a = 1$

(8) An amount of 5000 pounds is deposited in a bank gives a yearly compound interest 5 % for 7 years = ... pounds.

(a) 5350 (b) 6750 (c) 7035.5 (d) 8500

(9) If $f(X) = X^3 + 7$, then $f^{-1}(-1) =$ .... {such that $f^{-1}(X)$ is inverse function of $f(X)$}

(a) -2 (b) 1 (c) 2 (d) 8

(10) The solution set of the equation : $\log_X (64 X) = 4$ in $\mathbb{R}$ is ....

(a) $\{2\}$ (b) $\{4\}$ (c) $\{0, 4\}$ (d) $\{6\}$

(11) The simplest form of the expression : $\log_b a^2 \times \log_c b^3 \times \log_a c =$ ....

(a) 1 (b) 2 (c) 3 (d) 6

(12) The domain of the function $f : f(X) = \log_X (5 - X)$ is ....

(a) $]0, 5[$ (b) $[0, 5]$ (c) $]-\infty, 5[$ (d) $]0, 5[- \{1\}$

(13) The value of : $\log_3 \log_2 8 =$ ....

(a) -2 (b) -1 (c) 1 (d) 4

(14) $\lim\limits_{x \to \infty} (3x^{-5} + 4x^{-2} + 5) =$ ....

(a) zero (b) 5 (c) 12 (d) ∞

(15) $\lim\limits_{x \to 0} \frac{2x + \sin 3x}{5x + \tan 2x} =$ ....

(a) -1 (b) 1 (c) $\frac{5}{7}$ (d) $\frac{7}{5}$

(16) $\lim\limits_{x \to 0} \frac{2 - \cos x - \cos 2x}{x} =$ ....

(a) zero (b) 1 (c) 2 (d) 3

(17) $\lim\limits_{x \to 3} \frac{\sqrt{x+1} - 2}{x - 3} =$ ....

(a) $\frac{1}{4}$ (b) 4 (c) $\frac{1}{6}$ (d) 6

(18) $\lim\limits_{x \to 4} \frac{(x-2)^2 - 4}{x - 4} =$ ....

(a) 2 (b) 4 (c) 16 (d) not exist

(19) If the function f is continous at $x = 2$ where $f(x) = \begin{cases} a x^2 + 5 & , x \le 2 \\ 9 - b x & , x > 2 \end{cases}$

, then $2a + b =$ ....

(a) -2 (b) 2 (c) 7 (d) 14

(20) If $f(x) = \begin{cases} \frac{\sin^2 2x}{x^2} & , x < 0 \\ 2a + 3\cos x & , x > 0 \end{cases}$ and $\lim\limits_{x \to 0} f(x)$ exists , then $a =$ ....

(a) zero (b) 0.5 (c) 2 (d) -0.5

(21) The function $f : f(x) = \frac{4}{x^2} + \frac{4}{x^2 - 9}$ is continuous for each $x \in$ ....

(a) $\mathbb{R}$ (b) $\mathbb{R} - \{0\}$ (c) $\mathbb{R} - \{-3 , 3\}$ (d) $\mathbb{R} - \{0 , -3 , 3\}$

(22) In Δ ABC in which a = 3.5 cm. , m ($\angle$ A) = 30 , then the circumference of the circle that passes through the vertices of this triangle = ... cm. $\left(\pi = \frac{22}{7}\right)$

(a) 7 (b) 14 (c) 22 (d) 77

(23) In Δ XYZ , then 2 XZ × .... $= X^2 + Z^2 - Y^2$

(a) cos X (b) cos Y (c) cos Z (d) Sin Y

(24) In Δ ABC if sin A : sin B : sin C = 3 : 4 : 2 , then m ($\angle$ C) ≈ .... nearest degree.

(a) 29 (b) 57 (c) 82 (d) 89

(25) In Δ ABC if m ($\angle$ A) = 60° , m ($\angle$ B) = 50° and the length of the radius of its circumcircle = 5 cm. , then the area of triangle = ... nearest cm^3

(a) 9 (b) 12 (c) 31 (d) 62

(26) In Δ ABC : m ($\angle$ A) + m ($\angle$ B) = 120° , a = 2 cm. , b = 3 cm. then c = ... cm.

(a) 3 (b) 4 (c) $\sqrt{5}$ (d) $\sqrt{7}$

(27) The number of possible solution of Δ ABC in which a = 2 cm. , b = 10 cm. , m ($\angle$ A) = 42° is ....

(a) zero (b) 1 (c) 2 (d) infinite number.

Second Essay questions

Answer the following questions :

1 Graph the function $f : f(X) = \frac{12}{|X| + 3}$, from the graph , deduce the range and prove that the function is even.

2 If $f(X) = \begin{cases} 3X - 2 & , X \leq -2 \\ aX + b & , -2 < X < 5 \\ X^2 - 12 & , X \geq 5 \end{cases}$ is continuous at $X = -2$, $X = 5$, find the value of a and b

9 El-Dakahlia Governorate



Maths Inspection

First Multiple choice questions



Interactive test 9

Choose the correct answer from the given ones :

(1) In all the following relations , y is function in X except ....

(a) $y = \cos X$ (b) $y = 2$ (c) $y = X^2 - 1$ (d) $y^2 = X^2 + 1$

(2) If the domain of function $f : f(X) = \frac{2}{X^2 - 6X + k}$ is $\mathbb{R} - \{3\}$, then k = ...

(a) 3 (b) 9 (c) ± 9 (d) 18

(3) If $f(X) = \sqrt{X + 5}$, $g(X) = X^2$, then $(f \circ g)(2)$ = ...

(a) 3 (b) 4 (c) 7 (d) 9

(4) The odd function from the following function that are defined by the following rules is ....

(a) $f(X) = X^2 \sin X$ (b) $f(X) = \tan^2 X$ (c) $f(X) = \cos X$ (d) $f(X) = 1$

(5) If $f(X) = 7$, then the range of the function f is ....

(a) $\mathbb{R}$ (b) $\mathbb{R}^+$ (c) $\{7\}$ (d) $\mathbb{R} - \{7\}$

(6) $a^m \times a^m$ = ...

(a) a^{2m} (b) $m a^2$ (c) $2 a^m$ (d) a^{m^2}

(7) If $5^{x} = 2$, then $(25)^{x} =$ ....

(a) 2 (b) 4 (c) 10 (d) 625

(8) In the exponential function $f : f(x) = a^{x}$, $a > 1$, then $f(x) > 1$ when $x \in$ ....

(a) $\mathbb{R}$ (b) $\mathbb{R}^{+}$ (c) $\mathbb{R}^{-}$ (d) $\mathbb{Z}$

(9) If f is a function where $f(x) = 7x$, then $f^{-1}(x) =$ ....

(a) $7x$ (b) $\frac{x}{7}$ (c) $\frac{7}{x}$ (d) $7 - x$

(10) The form $\log_a x = y$ is equivalent to ....

(a) $\log_a y = x$ (b) $a^{y} = x$ (c) $a^{x} = y$ (d) $y = a x$

(11) If $\log(x + 11) = 2$, then $x =$ ....

(a) -9 (b) 22 (c) 89 (d) 91

(12) If $3^{x} = 5$, then $x =$ ....

(a) 3 (b) $\log_3 5$ (c) $\log_5 3$ (d) $\frac{5}{3}$

(13) $\log_b a \times \log_c b \times \log_a c =$ ....

(a) zero (b) 1 (c) a b c (d) a c

(14) $\lim\limits_{x \to 2} (3a^2) =$ ....

(a) 3 (b) 12 (c) $3a^2$ (d) 6

(15) $\lim\limits_{x \to 0} \frac{x^2 - x}{x} =$ ....

(a) zero (b) -1 (c) 1 (d) Doesn't exist.

(16) $\lim\limits_{x \to 0} \frac{\sqrt{x+1} - 1}{x} =$ ....

(a) zero (b) $\sqrt{2}$ (c) $\frac{1}{2}$ (d) as no existence

(17) If $\lim\limits_{x \to 2} \frac{x^2 - 4a}{x - 2}$ exists , then $a =$ ....

(a) -1 (b) 1 (c) 2 (d) 4

(18) $\lim\limits_{x \to 2} \frac{x^5 - 32}{x^3 - 8} =$ ....

(a) 4 (b) $\frac{5}{3}$ (c) zero (d) $6\frac{2}{3}$

(19) $\lim\limits_{x \to \infty} \frac{x^3 + 5}{x(2x^2 + 3)} =$ ....

(a) $\frac{5}{8}$ (b) 1 (c) $\frac{1}{2}$ (d) $\frac{5}{3}$

(20) $\lim\limits_{x \to 0} \frac{\sin 2x \tan 3x}{4x^2} =$ ....

(a) $\frac{1}{2}$ (b) $\frac{3}{4}$ (c) $\frac{3}{2}$ (d) 6

(21) If the function $f : f(X) = \begin{cases} \frac{X^2 - 1}{X - 1} & , X \neq 1 \\ 2a & , X = 1 \end{cases}$ is continuous at $X = 1$, then a = ...

(a) zero (b) 1 (c) 2 (d) 4

(22) In any triangle XYZ , z : X = ...

(a) sin X : sin Y (b) sin Y : sin Z (c) sin Z : sin X (d) sin Z : sin Y

(23) In Δ ABC , if $\frac{\sin A}{4} = \frac{\sin B}{9} = \frac{\sin C}{7}$, then the greatest angle in measure is ....

(a) $\angle$ A (b) $\angle$ B (c) $\angle$ C (d) Right

(24) In Δ ABC , b = 2 cm. , c = 2.5 cm. , cos A = $\frac{2}{5}$, then the type of Δ ABC is ....

(a) a right-angled triangle. (b) an isosceles triangle.

(c) an obtuse-angled triangle. (d) a scalene triangle.

(25) The number of possible solution of Δ ABC in which m ($\angle$ C) = 115° , c = 12 cm. , a = 9 cm. is ....

(a) zero (b) 1 (c) 2 (d) 3

(26) Δ XYZ is an equilateral triangle , the length of its sides is $10\sqrt{3}$ cm. , then the length of the diameter of its circumcircle is .... cm.

(a) 5 (b) 10 (c) 15 (d) 20

(27) in Δ ABC , 6 a = 4 b = 3 c , then the measure of the smallest angle in the triangle is ....

(a) 57° 28\` (b) 41° 12\` (c) 28° 57\` (d) 36° 52\`

Second Essay questions

Answer the following questions :

1 Draw the curve of the function f where $f(X) = X^3$, $X \in \mathbb{R}$, from the graph determine the range and discuss the monotony of the function.

2 **Find :** $\lim\limits_{X \to 2} \frac{X^2 - 4}{X^2 - 5X + 6}$

10 **Damietta Governorate**  **Educational Directorate**

First Multiple choice questions



Choose the correct answer from the given ones :

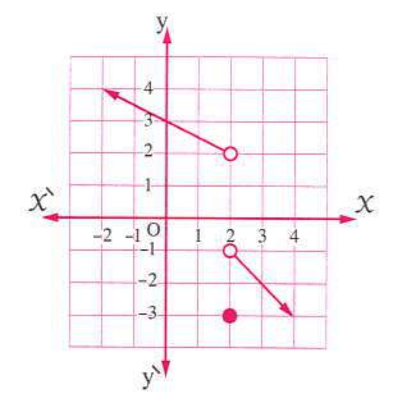
(1) If $f(X) = \sqrt{X+5}$, $g(X) = X^2$, then $(f \circ g)(2) =$ ....

(a) 7 (b) 3 (c) 4 (d) 9

(2) Which of the functions that are defined by the following rules represents an exponential decay function ? ....

(a) $f(X) = 2^X$ (b) $f(X) = \left(\frac{1}{3}\right)^{-X}$ (c) $f(X) = 3^X$ (d) $f(X) = \left(\frac{2}{3}\right)^X$

(3) In the opposite figure :



$\lim\limits_{X \to 2} f(X) =$ ....

(a) – 3

(b) 2

(c) – 1

(d) does not exist.

(4) A circle with diameter of length 20 cm. , passes through the vertices of Δ ABC which is an acute-angled triangle in which BC = 10 cm. , then m ($\angle$ A) = ...°

(a) 30 (b) 60 (c) 45 (d) 150

(5) The function defined by the following rules are one-to-one except ....

(a) $f(X) = X^3$ (b) $g(X) = 3X$ (c) $h(X) = \frac{1}{X}$ (d) $n(X) = X^2$

(6) If $2^{X-1} = 7$, then $X \simeq$ ....

(a) 2.81 (b) 3.81 (c) 2.6 (d) 3.6

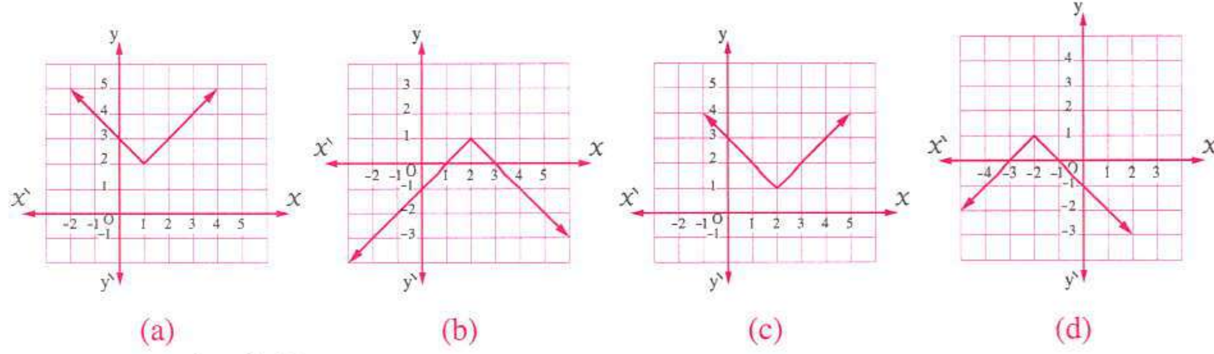
(7) If $\lim\limits_{X \to 3} \frac{X^2 - 2X + k}{X^2 - 9} = m$, where $m \in \mathbb{R}$, then $k \times m =$ ....

(a) $\frac{2}{3}$ (b) – 3 (c) – 2 (d) – 1

(8) In Δ ABC , $\frac{2b}{\sin B} =$ .... r (where r is the radius of its circumcircle)

(a) 1 (b) 2 (c) 4 (d) 8

(9) If $f : f(x) = 1 - |x - 2|$, then the figure which represents the function f is ....



(a) (b) (c) (d)

(10) If $\lim\limits_{x \to 0} \frac{(a+3)\,x}{\sin a\,x} = \frac{2}{5}$, then a = ...

(a) -5 (b) -3 (c) -1 (d) 3

(11) In Δ ABC , a = 9 cm. , b = 15 cm. , m (∠ C) = 106°

, then its perimeter ≃ .... cm.

(a) 44 (b) 42 (c) 34 (d) 28

(12) The range of the function $f : f(x) = x\,|x|$ is ....

(a) $\mathbb{R}^+$ (b) $\mathbb{R}^-$ (c) $\mathbb{R}$ (d) $[0 , \infty[$

(13) $\lim\limits_{x \to 16} \frac{\sqrt[4]{x^5} - 32}{x - 16} =$ ....

(a) 5 (b) $\frac{5}{2}$ (c) $\frac{5}{4}$ (d) $\frac{5}{8}$

(14) The solution set of the equation : $|x| + 3 = 0$ in $\mathbb{R}$ is ....

(a) $\{-3\}$ (b) $\{3\}$ (c) $\{-3 , 3\}$ (d) $\varnothing$

(15) $\log_b a \times \log_c b \times \log_d c \times \log_a d =$ ....

(a) zero (b) 1 (c) abcd (d) ad

(16) $\lim\limits_{x \to 2} \frac{(x+1)^4 - 81}{x - 2} =$ ....

(a) 18 (b) 81 (c) -108 (d) 108

(17) $\lim\limits_{x \to 0} \frac{1 - \cos\theta}{3\,x} =$ ....

(a) $\frac{4}{3}$ (b) $\frac{3}{4}$ (c) 1 (d) zero

(18) The number of possible solution of Δ ABC in which a = 8 cm. , b = 10 cm. , m (∠ A) = 42° is ....

(a) 1 (b) 2 (c) infinite number. (d) zero

(19) The solution set of the equation : $3^{x} + 3^{3-x} = 12$ in $\mathbb{R}$ is ....

(a) $\{1 , 2\}$ (b) $\{0 , 3\}$ (c) $\{3 , 4\}$ (d) $\{-3 , -4\}$

(20) If $\log 3 = x$, $\log 4 = y$, then $\log 12 =$ ....

(a) $x + y$ (b) $x y$ (c) $x - y$ (d) $\log x + \log y$

(21) If ABC is a triangle in which $a = 4$ cm. , $b = 4\sqrt{3}$ cm. , $c = 8$ cm. , then cosine of the smallest angle equals ....

(a) $\frac{1}{2}$ (b) $\frac{\sqrt{3}}{2}$ (c) 1 (d) zero

(22) $\lim\limits_{x \to \infty} \frac{4 a x^n - 4 x + 5}{3 - 9 x + 8 x^2} = 3$, then $a + n =$ ....

(a) 8 (b) -8 (c) 9 (d) 4

(23) The straight line $y = 9$ cuts the curve of the function $f : f(x) = 3^x$ at the point ....

(a) $(0 , 9)$ (b) $(-2 , 9)$ (c) $(2 , 9)$ (d) $(1 , 9)$

(24) If the function f is continuous at $x = 2$ where $f(x) = \begin{cases} a x^2 + 5 , & \text{at } x \le 2 \\ 9 - b x , & \text{at } x > 2 \end{cases}$

, then $2 a + b =$ ....

(a) 7 (b) 14 (c) 2 (d) -2

(25) If $f(x) = \frac{x + k}{x - 1}$ and $(5 , 2) \in f^{-1}$, then $k =$ ....

(a) zero (b) 1 (c) 2 (d) 3

(26) In Δ ABC , if $m(\angle B) = 60°$, $m(\angle C) = 30°$, $c = 4$ cm. , then $b =$ .... cm.

(a) 4 (b) 8 (c) $2\sqrt{3}$ (d) $4\sqrt{3}$

(27) The solution set of the inequality $|2 x - 3| \ge 13$ in $\mathbb{R}$ is ....

(a) $]-5 , 8[$ (b) $[-5 , 8]$ (c) $\mathbb{R} -]-5 , 8[$ (d) $\mathbb{R} - [-5 , 8]$

Second Essay questions

Answer the following questions :

1 Draw the curve of the function $f(x) = \frac{1}{x - 2} + 1$ **, then from the graph :**

(1) Discuss the monotonicity of f

(2) Determine whether f is even , odd or otherwise.

---

2 Redefine (if possible) the function $f : f(x) = \frac{\sqrt{x - 1} - 2}{x - 5}$ to become continuous at $x = 5$

11 Beni Suef Governorate



Directorate of Official Language Schools

First Multiple choice questions

Choose the correct answer from the given ones :

(1) In Δ XYZ , if 3 sin X = 4 sin Y = 2 sin Z , then $x : y : z =$ ....

(a) 2 : 3 : 4 (b) 6 : 4 : 3 (c) 3 : 4 : 6 (d) 4 : 3 : 6

(2) ABC is an equilateral triangle , its side length equals $8\sqrt{3}$ cm. , then the length of the diameter of its circumcircle equals .... cm.

(a) 8 (b) $16\sqrt{3}$ (c) 16 (d) $4\sqrt{3}$

(3) The curve of the function g : g $(x) = |x| - 2$ is the same as the curve of the function $f : f(x) = |x|$ by translation two units in direction of ....

(a) $\overrightarrow{OX}$ (b) $\overrightarrow{OX'}$ (c) $\overrightarrow{OY}$ (d) $\overrightarrow{OY'}$

(4) The point of symmetry of the curve of the function $f : f(x) = \frac{1}{x-3} + 4$ is ....

(a) (3 , – 4) (b) (– 3 , – 4) (c) (3 , 4) (d) (– 3 , 4)

(5) The solution set of the inequality : $|2x - 5| \leq 9$ in $\mathbb{R}$ is ....

(a) $]-\infty , 7[$ (b) $\mathbb{R} - [-2 , 7]$ (c) $\mathbb{R} -]-2 , 7[$ (d) $[-2 , 7]$

(6) If $x^{\frac{3}{2}} = 64$, then $x =$ ....

(a) 2 (b) 4 (c) 16 (d) 512

(7) The exponential function of base a is decreasing if ....

(a) $a > 0$ (b) $a < 0$ (c) $0 < a < 1$ (d) $-1 < a < 0$

(8) The solution set of the equation $\log_x (3x - 2) = 2$ in $\mathbb{R}$ is ....

(a) {1 , 2} (b) {1} (c) {2} (d) $\varnothing$

(9) The expression $\frac{3 \log 2}{\log 4 + \log 3}$ is equivalent to ....

(a) $\log_3 2$ (b) $\log_7 2$ (c) $\log_{12} 8$ (d) $\log_7 8$

(10) If $3^{x+5} = \frac{1}{27}$, then $x =$ ....

(a) – 8 (b) – 3 (c) 3 (d) 8

(11) If f is a function where $f(x) = 7x$, then $f^{-1}(x) =$ ....

(a) $7x$ (b) $\frac{x}{7}$ (c) $\frac{7}{x}$ (d) $7 - x$

(12) If $7^{x+1} = 3^{2x+2}$, then $5^{x+1} =$ ....

(a) 2 (b) zero (c) 1 (d) 5

(13) If the function f^{-1} where $f^{-1} = \{(2, 3), (5, b)\}$ is the inverse function of the function f where $f = \{(4, 5), (a, 2)\}$, then a – b = ...

(a) – 1 (b) zero (c) 1 (d) 2

(14) If the curve of the polynomial function f intersects the X-axis at $X = 3$, then ....

(a) $\lim_{X \to 3} f(X) = 0$ (b) $\lim_{X \to 0} f(X) = 3$

(c) $\lim_{X \to 0} f(X) = 0$ (d) $\lim_{X \to 3} f(X) = 3$

(15) $\lim_{X \to 3} \frac{\sqrt{X+1} - 2}{X - 3} =$ ....

(a) $\frac{1}{6}$ (b) $\frac{1}{4}$ (c) 4 (d) 6

(16) $\lim_{X \to \infty} \frac{3X^2}{X(2X-1)} =$ ....

(a) $\frac{3}{2}$ (b) zero (c) 3 (d) $\frac{2}{3}$

(17) $\lim_{X \to 0} \frac{\sin 2X \tan 3X}{4X^2} =$ ....

(a) $\frac{1}{2}$ (b) $\frac{3}{4}$ (c) $\frac{3}{2}$ (d) 6

(18) $\lim_{X \to 0} \frac{1 - \cos X}{3X} =$ ....

(a) – 1 (b) zero (c) 1 (d) does not exist

(19) If $f(X) = \sqrt[3]{X-2}$, $g(X) = \sqrt{X-4}$, then the domain of $(f \circ g) =$ ....

(a) $[4, \infty[$ (b) $\mathbb{R}$ (c) $[2, \infty[$ (d) $]4, \infty[$

(20) The function $f : f(X) = (X-1)^2 + 2$ is increasing on the interval ....

(a) $\mathbb{R}$ (b) $]1, \infty[$ (c) $]-\infty, 1[$ (d) $]-1, 1[$

(21) The number of possible solutions of Δ ABC in which m (∠ C) = 115°, c = 12 cm., a = 8 cm. is ....

(a) 1 (b) 2 (c) 3 (d) zero

(22) If Δ XYZ, m (∠ Y) = 50°, X = 10 cm. has two solutions, then y could be .... cm.

(a) 6 (b) 7.66 (c) 8 (d) 11

(23) $\lim_{X \to \infty} \frac{1}{X}\sqrt{8 + 9X^2} =$ ....

(a) $2\sqrt{2}$ (b) 3 (c) $-2\sqrt{2}$ (d) – 3

(24) If the function $f : f(X) = \begin{cases} \frac{X^2 - 1}{X - 1} & , \text{ when } X \neq 1 \\ 2a & , \text{ when } X = 1 \end{cases}$ is continuous at $X = 1$, then a = ...

(a) zero (b) 1 (c) 2 (d) 4

(25) The measure of the greatest angle in triangle the lengths of its sides are 3 cm. , 5 cm. and 7 cm. equals ....

(a) 100° (b) 110° (c) 120° (d) 150°

(26) In Δ ABC , if m (∠ A) + m (∠ B) = 120° , a = 2 cm. , b = 3 cm. , then c = ... cm.

(a) 3 (b) 4 (c) $\sqrt{7}$ (d) $\sqrt{5}$

(27) If $f(X) = \begin{cases} 3 - X & , \text{ when } X < 1 \\ 4 & , \text{ when } X = 1 \\ X^2 + 1 & , \text{ when } X > 1 \end{cases}$, then $\lim_{X \to 1} f(X) =$ ....

(a) 1 (b) 2 (c) 4 (d) does not exist

Second Essay questions

Answer the following questions :

1 **Find :** $\lim_{X \to -3} \frac{X^4 - 81}{X^5 + 243}$

2 Prove that the function f where $f(X) = X^3 + 2$ is one-to-one function.

12 El-Menia Governorate



Bani Mazar Administration
Math Department

First Multiple choice questions

Choose the correct answer from the given ones :

(1) The odd function of following is $f(X) =$ ....

(a) $\cos X$ (b) $X \sin X$ (c) 3 (d) $4X$

(2) In Δ ABC : 2 sin A = 3 sin B = 3 sin C , then cos A = ...

(a) $\frac{1}{8}$ (b) $\frac{-1}{8}$ (c) $\frac{1}{3}$ (d) $\frac{-3}{4}$

(3) The solution set in ℝ of the equation : $|X + 2| = X$ is ....

(a) ℝ (b) ∅ (c) {– 1} (d) {– 2}

(4) $\lim_{X \to 5} \frac{(X + 2)^2 - 49}{X - 5} =$ ....

(a) 5 (b) 14 (c) 49 (d) 98

(5) Solution set of the equation $(2X - 1)^{\frac{3}{2}} = 27$ ....

(a) {– 5} (b) {4} (c) {5} (d) {– 5 , 5}

(6) In Δ ABC if : a = c , b = 2 cm. , cos A = $\frac{2}{5}$, then a = ...

(a) $\frac{5}{2}$ (b) 2 (c) 3 (d) 4

(7) The function $f(X) = a^X$ is decreasing on its domain $\mathbb{R}$ when : ....

(a) $a > 1$ (b) $a = 1$ (c) $0 < a < 1$ (d) $a = -1$

(8) $\lim\limits_{X \to \infty} \frac{X^3 + 5}{X(2X^2 + 3)} =$ ....

(a) $\frac{5}{8}$ (b) 1 (c) $\frac{1}{2}$ (d) $\frac{5}{3}$

(9) The solution set of $|X + 1| \leq 3$ in $\mathbb{R}$ is ....

(a) $]-2, 4[$ (b) $[-4, 2]$ (c) $\mathbb{R} - [-2, 4]$ (d) $\mathbb{R} -]-4, 2[$

(10) The measure of greatest angle in triangle whose side lengths are 6 cm. , 10 cm. , 14 cm. = ...

(a) 120 (b) 30 (c) 60 (d) 150

(11) If $\log 0.01 = 3 - X$, then $X =$ ....

(a) -3 (b) -1 (c) 2 (d) 5

(12) $\lim\limits_{X \to -1} \frac{X^8 + X^3}{X^5 - X^3} =$ ....

(a) $\frac{5}{2}$ (b) $\frac{2}{5}$ (c) $-\frac{2}{5}$ (d) $-\frac{5}{2}$

(13) In Δ ABC if a = 6 cm. , $m(\angle A) = 30°$, then the circumference for the circle which passing through vertices of Δ ABC = ... cm.

(a) 6π (b) 12π (c) 24π (d) $3\sqrt{\pi}\sqrt[3]{\pi}$

(14) If $f(X) = 2^{X+2}$ and $f(a) = 8$, then a = ...

(a) 3 (b) 2 (c) 1 (d) 4

(15) $\lim\limits_{X \to \frac{\pi}{4}} \frac{\tan X}{2X} =$ ....

(a) $\frac{1}{2}$ (b) $\frac{\pi}{2}$ (c) $\frac{4}{\pi}$ (d) $\frac{2}{\pi}$

(16) The range of the function $f(X) = |X - 2| - 2$ is ....

(a) $[-2, \infty[$ (b) $[2, \infty[$ (c) $\mathbb{R}$ (d) $\mathbb{R} - \{2\}$

(17) In Δ XYZ if : $\frac{X}{2 \sin X} = 8$, then the diameter length of the circle which passing by its vertices = ... cm.

(a) 16 (b) 8 (c) 4 (d) 64

(18) If $\lim\limits_{X \to \infty} \frac{mX^2 + 7}{2X^2 - 5X} = -2$, then m = ...

(a) 2 (b) 4 (c) -4 (d) -2

(19) The solution set of the equation : $\log_X (X + 2) = 2$ in $\mathbb{R}$ is ....

(a) $\{-2\}$ (b) $\{2\}$ (c) $\{-1, 2\}$ (d) $\{-2, 2\}$

(20) If $f(X) = 4^X$ and $f(X + 1) = 64$, then $X =$ ....

(a) 4 (b) 0 (c) 1 (d) 2

(21) $\lim\limits_{\frac{1}{x} \to 0} (x^{-2} + 5x^{-1} - 1) = \ldots\ldots\ldots\ldots$

(a) 8 (b) undefined. (c) -1 (d) 1

(22) If $f(x) = x^2 - 4$, $g(x) = x - 2$, then $(g \circ f)(1) = \ldots\ldots\ldots\ldots$

(a) 5 (b) 3 (c) -5 (d) -3

(23) $\lim\limits_{x \to 3} \frac{\sqrt{x+1} - 2}{x - 3} = \ldots\ldots\ldots\ldots$

(a) 2 (b) $\frac{1}{4}$ (c) $\frac{1}{2}$ (d) 4

(24) $\log_b 25 \times \log_5 b^2 = \ldots\ldots\ldots\ldots$ where $b > 1$

(a) 5 b (b) 4 (c) 5 (d) b^2

(25) If a = 5 cm. , b = 3 cm. , $\sin C = \frac{3}{5}$, the the area of Δ ABC = ... cm^2

(a) 6 (b) 9 (c) 12 (d) 4.5

(26) If $3^{x-1} = 4^{1-x}$, then $2^{x+1} = \ldots\ldots\ldots\ldots$

(a) 0 (b) 2 (c) 1 (d) 4

(27) $\lim\limits_{x \to \infty} \frac{2x - 3}{\sqrt[3]{8x^3 - 7}} = \ldots\ldots\ldots\ldots$

(a) 1 (b) 2 (c) 0 (d) 4

Second Essay questions

Answer the following questions :

1 Graph the curve of function $f : f(x) = (x - 1)^2 + 2$ **, then from the graph find :**

(1) The domain.

(2) Determine the function is odd , even or otherwise.

2 Discuss the continuity of the function $f : f(x) = \begin{cases} \frac{x^2 + 2x - 3}{x - 1} & , x < 1 \\ x^2 + 3 & , x \geq 1 \end{cases}$ at $x = 1$

13 Assiut Governorate



Administration of Distinguished and Governmental Language Schools

First Multiple choice questions

Choose the correct answer from the given ones :

(1) The domain of the function $f : f(x) = \frac{5}{\sqrt{x - 4}}$ is ....

(a) $[4 , \infty[$ (b) $]4 , \infty[$ (c) $]-\infty , 4]$ (d) $]-\infty , 4[$

(2) is $x^{\frac{3}{2}} = 64$, then $x = \ldots\ldots\ldots\ldots$

(a) 512 (b) 16 (c) 4 (d) 2

(3) Which of the following functions is a one-to-one function ? ....

(a) $f(x) = \cos x$ (b) $g(x) = x^2$ (c) $h(x) = x^3$ (d) $k(x) = x^4 + x^2$

(4) If f is a function where $f(x) = 7x$, then $f^{-1}(x) =$ ....

(a) $7x$ (b) $\frac{x}{7}$ (c) $\frac{7}{x}$ (d) $7 - x$

(5) The range of the function $f : f(x) = \frac{x^2 - 1}{x - 1}$ is ....

(a) $\mathbb{R}$ (b) $\mathbb{R} - \{-2\}$ (c) $\mathbb{R} - \{2\}$ (d) $\{1\}$

(6) $\lim_{x \to 3} \frac{x^2 - x - 6}{x^2 + x - 12} =$ ....

(a) $\frac{5}{7}$ (b) $\frac{1}{7}$ (c) -1 (d) -5

(7) The vertex point of the curve of the function $f : f(x) = |x + 3| - 2$ is ....

(a) $(3, 2)$ (b) $(-3, -2)$ (c) $(-3, 2)$ (d) $(3, -2)$

(8) If $\lim_{x \to a} \frac{x^8 - a^8}{x^6 - a^6} = 48$, then a = ...

(a) 4 (b) 6 (c) ± 4 (d) ± 6

(9) If $f(x) = 3x - 1$, $g(x) = x^2$, then $(g \circ f)(-2) =$ ....

(a) -7 (b) 11 (c) -49 (d) 49

(10) $\lim_{x \to 2} \frac{x^3 - 8}{3x^2 - 12} =$ ....

(a) 1 (b) 2 (c) 0 (d) 3

(11) The solution set of the inequality $|3 - x| > 0$ is ....

(a) $]-3, 3[$ (b) $\mathbb{R} - [-3, 3]$ (c) $\mathbb{R} - \{3\}$ (d) $\mathbb{R}$

(12) $\lim_{x \to \infty} \frac{\sqrt[3]{64x^3 + 7x - 2}}{3x + 2} =$ ....

(a) 4 (b) 3 (c) $\frac{2}{3}$ (d) $\frac{4}{3}$

(13) The solution set of the equation : $|x + 2| + x = -2$ is ....

(a) $\varnothing$ (b) $\mathbb{R}$ (c) $]-\infty, 2[$ (d) $]-\infty, -2]$

(14) ABC is a triangle in which a = 23 cm. , b = 15 cm. and its perimeter = 70 cm. , then measure of the greatest angle in the triangle equals ....

(a) $77^\circ\ 49'$ (b) $113^\circ\ 2'$ (c) $131^\circ\ 2'$ (d) 150°

(15) If $f(x - 1) = 2^{x + 1}$, then $f(x) =$ ....

(a) 2^x (b) $2^{x - 1}$ (c) $2^{x + 2}$ (d) $2^{x - 2}$

(16) $\lim_{x \to 0} \frac{x \sin 2x}{x^2} =$ ....

(a) 0 (b) 1 (c) 2 (d) 4

(17) The exponential function of base a is increasing if ....

(a) $a > 0$ (b) $a > 1$ (c) $0 < a < 1$ (d) $a = 1$

(18) In triangle ABC , m (∠ A) = 45° , the length of the radius of its circumcircle = 6 cm. , then a = ...

(a) 13 (b) $6\sqrt{2}$ (c) 12 (d) $\sqrt{2}$

(19) The solution set of the equation : $3^{x+1} + 3^{x} = 12$ in $\mathbb{R}$ is ....

(a) $\{0\}$ (b) $\{3\}$ (c) $\{1\}$ (d) $\{1, 0\}$

(20) If r is the length of the radius of the circumcircle of the triangle XYZ , then $\frac{y}{2 \sin Y}$ = ...

(a) r (b) 2 r (c) $\frac{1}{2}$ r (d) 4 r

(21) If $\log_3 (2x + 3) = 2$, then x = ...

(a) 3 (b) 2 (c) 9 (d) 4

(22) If $f(x) = \begin{cases} 3x - 1 & , x \neq 2 \\ 6 & , x = 2 \end{cases}$, then $\lim\limits_{x \to 2} f(x)$ = ...

(a) – 5 (b) 5 (c) 6 (d) does not exist.

(23) If $\log_2 x + \log_2 x^2 = 6$, then x = ...

(a) 2 (b) 4 (c) 6 (d) 216

(24) If the function $f : f(x) = \begin{cases} \frac{x^2 - 9}{x - 3} & , x \neq 3 \\ 2a & , x = 3 \end{cases}$ is continuous at $x = 3$, then a = ...

(a) 2 (b) $\frac{3}{2}$ (c) – 3 (d) 3

(25) In Δ XYZ , if x = y , then cos X = ...

(a) $\frac{2y^2}{z}$ (b) $\frac{z}{2y}$ (c) $\frac{z}{4x}$ (d) $\frac{y}{2x}$

(26) If the opposite figure represents the graph of function f , then $\lim\limits_{x \to 1} f(x)$ = ...

(a) 2

(b) 3

(c) 1

(d) does not exist.

(27) By solving the triangle ABC in which a = 5 cm. , b = 7 cm. , m (∠ C) = 65° , then c = ... cm.

(a) 4.4 (b) 2.1 (c) 6.7 (d) 8.2

Second Essay questions

Answer the following questions :

1 [a] Draw the graph of the function $f : f(x) = x\,|x|$ and deduce from the graph its range and its type of being odd , even or otherwise.

[b] **Find the S.S. of the equation :** $\log_x 81 = 4$ in $\mathbb{R}$

2 [a] **Find :** $\lim\limits_{x \to 2} \frac{x^2 - 4}{x^2 - 5x + 6}$

[b] **Find :** $\lim\limits_{x \to 5} \frac{\sqrt{x-1} - 2}{x - 5}$

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First Multiple choice questions

Choose the correct answer from the given ones :

(1) Solution set of the inequality : $|x + 2| \leq -3$ in $\mathbb{R}$ is ....

(a) $\mathbb{R}$ (b) $\varnothing$ (c) $[-5 , 1]$ (d) $]-5 , 1[$

(2) If $f(x) = \begin{cases} \frac{\sqrt{1+x} - 1}{x} & , \text{ when } x \neq 0 \\ k & , \text{ when } x = 0 \end{cases}$ continuous at $x = 0$, then k = ...

(a) 0 (b) 2 (c) $\frac{1}{2}$ (d) -1

(3) Domain of the function $f : f(x) = \sqrt{x + 2}$ is ....

(a) $[-2 , \infty[$ (b) $[-2 , 2]$ (c) $]-\infty , 2]$ (d) $\mathbb{R}$

(4) $\lim\limits_{x \to 0} \frac{\sin 2x + \tan 3x}{5x} =$ ....

(a) 0 (b) 5 (c) 2 (d) 1

(5) If $\log 2 = x$, $\log 3 = y$, then $\log 6 =$ ....

(a) xy (b) $x \div y$ (c) $x + y$ (d) x^y

(6) $\lim\limits_{x \to 2} \frac{2x^2 - x - k}{x^2 - x - 2} = \frac{7}{3}$, then k = ...

(a) 2 (b) 7 (c) -6 (d) 6

(7) $\lim\limits_{x \to \infty} \frac{5x^{-3} - x^{-1} + 5}{2x^{-3} + 2x^{-1} + 7} =$ ....

(a) $\frac{5}{7}$ (b) $\frac{7}{5}$ (c) $\frac{1}{2}$ (d) $\frac{5}{2}$

(8) If $5^{x} = 2$, then $5^{x+2} =$ ....

(a) 5 (b) 2 (c) 25 (d) 50

(9) In Δ XYZ if $x = 5$ cm. , $y = 7$ cm. , $z = 8$ cm. , then m ($\angle$ Y) = ...

(a) 30° (b) 60° (c) 45° (d) 120°

(10) Solution set of the equation $(2x + 3)^{\frac{4}{3}} = 81$ in $\mathbb{R}$ is ....

(a) $\{12 , -12\}$ (b) $\{15 , -15\}$ (c) $\{15 , -15\}$ (d) $\{0\}$

(11) $\lim\limits_{x \to 0} \left(\frac{x^2 + 2x}{x}\right) =$ ....

(a) 2 (b) 1 (c) 0 (d) -2

(12) $\log_2 7 \times \log_7 2 =$ ....

(a) 0 (b) 2 (c) 1 (d) 3

(13) In Δ ABC if $\frac{\sin A}{3} = \frac{2 \sin B}{5} = \frac{\sin C}{4}$, then a : b : c = ...

(a) 6 : 5 : 8 (b) 8 : 5 : 6 (c) 7 : 2 : 4 (d) 3 : 5 : 6

(14) Range of the function $f : f(x) = \left|\frac{1}{x}\right|$ is ....

(a) $]-\infty , \infty[$ (b) $]0 , \infty[$ (c) $[0 , \infty[$ (d) $\mathbb{R} - \{0\}$

(15) The curve of the function $f : f(x) = -2(x - 1)^3 + 2$ is symmetric about the point ....

(a) $(-1 , 2)$ (b) $(1 , -2)$ (c) $(0 , 0)$ (d) $(1 , 2)$

(16) $\lim\limits_{x \to -3} \frac{x^5 + 243}{x^3 + 27} =$ ....

(a) 15 (b) -15 (c) 3 (d) $\frac{5}{3}$

(17) If $\log x \in]0 , 1[$, then $x \in$ ....

(a) $]0 , 1[$ (b) $]1 , 2[$ (c) $]1 , 10[$ (d) $]-\infty , 1[$

(18) $\lim\limits_{x \to 3} \sqrt{x - 3} =$ ....

(a) -3 (b) 3 (c) 0 (d) does not exist

(19) In Δ DEF if m ($\angle$ E) = 35° , m ($\angle$ F) = 40° , EF = 12 cm.

, then DE $\simeq$ .... to nearest centimeter.

(a) 2 (b) 3 (c) 8 (d) $\sqrt{3}$

(20) In Δ ABC if a = 4 cm. , c = 16 cm. , m ($\angle$ B) = 115° , then b $\simeq$ .... cm.

(a) 326 (b) 18 (c) 20 (d) 16

(21) If $\log_4 (x^3 - 11) = 2$, then $x =$ ....

(a) 3 (b) 16 (c) 27 (d) 11

(22) If f is function where $f(\mathcal{X}) = \mathcal{X} - 3$, then $f^{-1}(\mathcal{X}) =$ ....

(a) $\mathcal{X} + 3$ (b) $-\mathcal{X} + 3$ (c) $\mathcal{X} - 3$ (d) $\frac{1}{\mathcal{X} - 3}$

(23) If r is the radius length of circumcircle of Δ XYZ , then $\frac{\mathcal{X}}{4 \sin X} =$ ....

(a) r (b) 2 r (c) $\frac{1}{2}$ r (d) $\frac{1}{4}$ r

(24) Function f where $f(\mathcal{X}) = a^{\mathcal{X}}$ is increasing on its domain when ....

(a) $a = 1$ (b) $a > 1$ (c) $a = -1$ (d) $0 < a < 1$

(25) In Δ ABC if a = 7 cm. , c = 9 cm. , m ($\angle$ B) = 60° , then number of possible solution of the triangle is ....

(a) 0 (b) 1 (c) 2 (d) 3

(26) If $f(\mathcal{X}) = 2\mathcal{X} + 1$, $(f \circ g)(\mathcal{X}) = 3\mathcal{X} + 2$, then $g(\mathcal{X}) =$ ....

(a) $\mathcal{X} + 1$ (b) $5\mathcal{X} + 3$ (c) $\frac{3}{2}\mathcal{X} + \frac{1}{2}$ (d) $2\mathcal{X} + 3$

(27) $\lim\limits_{\mathcal{X} \to 0} \frac{(\mathcal{X} + 2)^5 - 32}{\mathcal{X}} =$ ....

(a) 4 (b) 16 (c) 32 (d) 80

Second Essay questions

Answer the following questions :

1 Represent graphically the function $f : f(\mathcal{X}) = (\mathcal{X} - 1)^2 + 2$ from drawing determine range of the function and discuss its monotonicity and show if the function is odd , even or otherwise is the function one-to-one or not ?

2 If $f(\mathcal{X}) = \begin{cases} \frac{\sin^2 2\mathcal{X}}{\mathcal{X}^2} & , \text{ when } \mathcal{X} < 0 \\ 3\mathcal{X} + 4 & , \text{ when } \mathcal{X} > 0 \end{cases}$ discuss the existence of $\lim\limits_{\mathcal{X} \to 0} f(\mathcal{X})$

حمل الآن

مجانا وحصريا

امتحانات رقم (3)







2023

First Examinations of some governorate's schools

1 Cairo Governorate



El-Waili Educational Zone
Skr Koriesh Formal lang. School

First Multiple choice questions

Choose the correct answer from the given ones :

(1) If $f(X) = X + 2$, then $f^{-1}(X) =$ ....

(a) $X + 2$ (b) $-X + 2$ (c) $X - 2$ (d) $\frac{X}{2}$

(2) $\lim_{X \to 0} \frac{2X + 7}{\cos X} =$ ....

(a) 7 (b) 8 (c) 9 (d) 1

(3) If r is the radius of the circumcircle of Δ ABC , then $\frac{a}{2 \sin A} =$ ....

(a) r (b) 2 r (c) $\frac{1}{2}$ r (d) r^2

(4) The solution set of $|X - 3| \leq -4$ in $\mathbb{R}$ is ....

(a) $]-2 , 6[$ (b) $[2 , -6]$ (c) $\mathbb{R}$ (d) $\varnothing$

(5) $\lim_{X \to -3} \frac{X^2 + 4X + 3}{X^2 - 9} =$ ....

(a) 1 (b) $\frac{1}{3}$ (c) $\frac{1}{4}$ (d) $\frac{1}{2}$

(6) The domain of $f : f(X) = \sqrt{X^2 + 16}$ is ....

(a) $\mathbb{R}$ (b) $\mathbb{R} -]-4 , 4[$ (c) $\mathbb{R} - \{-4 , 4\}$ (d) $[-4 , 4]$

(7) In Δ XYZ , $\frac{X^2 + y^2 - z^2}{2 X y} =$ ....

(a) cos ($\angle$ X) (b) cos ($\angle$ Y) (c) cos ($\angle$ Z) (d) sin ($\angle$ Z)

(8) The function $f : f(X) = \frac{1}{\sqrt[3]{X + 2}}$ is continuous for all $X \in$ ....

(a) $\mathbb{R}$ (b) $\mathbb{R} - \{-2\}$ (c) $[-2 , \infty[$ (d) $]-2 , \infty[$

(9) $\lim_{X \to 0} \frac{\sin X}{X + 6} =$ ....

(a) 0 (b) 1 (c) 3 (d) 6

(10) If a = sin B , b = sin C , c = sin A , then the circumference of the circumcircle of Δ ABC = ...

(a) 1 (b) $\frac{\pi}{2}$ (c) π (d) 2π

(11) The solution set of the equation $\log X^2 = \log 4 + \log 9$ in $\mathbb{R}$ is ....

(a) $\{6\}$ (b) $\{-6\}$ (c) $\{6 , -6\}$ (d) $\varnothing$

(12) $\lim\limits_{x \to \infty} \dfrac{(12)^{\frac{1}{x}}}{x+7} = \ldots\ldots\ldots\ldots$

(a) 1 (b) 0 (c) $\frac{12}{7}$ (d) ∞

(13) If f is an even function , $3 \in$ the domain , then $f(3) + f(-3) = \ldots\ldots\ldots\ldots$

(a) 0 (b) 6 (c) 3 (d) $2 f(3)$

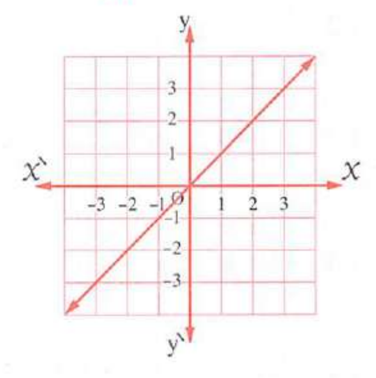
(14) The point of symmetry of $f : f(x) = (x-2)^3 + 1$ is $\ldots\ldots\ldots\ldots$

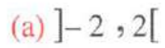
(a) (2 , 1) (b) (−2 , 1) (c) (2 , −1) (d) (−2 , −1)

(15) If $3^{x-2} = 2^{x-2}$, then $x = \ldots\ldots\ldots\ldots$

(a) 3 (b) −2 (c) 0 (d) 2

(16) The range of the function represented in the opposite figure = $\ldots\ldots\ldots\ldots$




(a) $]-2 , 2[$

(b) $\{2 , -2\}$

(c) $\mathbb{R}$

(d) $\mathbb{R} - \{2 , -2\}$

(17) $\lim\limits_{x \to 2} \dfrac{x^3 - 8}{3x^2 - 12} = \ldots\ldots\ldots\ldots$

(a) 1 (b) 2 (c) 0 (d) 3

(18) If $\angle A$ supplements $\angle C$, then $\cos(\angle A) + \cos(\angle C) = \ldots\ldots\ldots\ldots$

(a) 1 (b) 0 (c) $\frac{1}{2}$ (d) −1

(19) $\lim\limits_{x \to \infty} \dfrac{2x-5}{3x-7} = \ldots\ldots\ldots\ldots$

(a) 1 (b) $\frac{2}{3}$ (c) $\frac{1}{3}$ (d) $\frac{1}{2}$

(20) The solution set of $|2x+4| = 1 - x$ in $\mathbb{R}$ is $\ldots\ldots\ldots\ldots$

(a) $\{-1\}$ (b) $\{-1 , -5\}$ (c) $\mathbb{R}$ (d) $\{-5\}$

(21) $\lim\limits_{x \to 5} \dfrac{x^2 - 25}{x - 5} = \ldots\ldots\ldots\ldots$

(a) 5 (b) 10 (c) 15 (d) 20

(22) In ΔABC , if $\sin A = 2 \sin C$, BC = 6 cm. , then AB = $\ldots\ldots\ldots\ldots$ cm.

(a) 3 (b) 4 (c) 6 (d) 9

(23) If $2^{x-1} = 8$, then $x = \ldots\ldots\ldots\ldots$

(a) 1 (b) 2 (c) 3 (d) 4

(24) $\dfrac{(27)^{-3} \times (12)^2}{16 \times (81)^{-2}} = \ldots\ldots\ldots\ldots$

(a) 3 (b) 4 (c) 9 (d) 1

(25) If $\log x - \log 2 = \log 4$, then $x =$ ....

(a) 4 (b) 6 (c) 8 (d) 16

(26) $\lim\limits_{x \to \infty} \frac{x^3 - 2}{|x|^3 + 1} =$ ....

(a) 0 (b) 1 (c) 2 (d) 3

(27) The S.S. of the equation : $\log_x 125 = 3$ in $\mathbb{R}$ is ....

(a) $\{5\}$ (b) $\{3\}$ (c) $\varnothing$ (d) $\{2\}$

(28) $\lim\limits_{x \to 0} 2x^2 + 3 =$ ....

(a) 2 (b) 3 (c) 5 (d) -7

Second Essay questions

Answer the following questions :

1 **Find : (1)** $\lim\limits_{x \to 5} \frac{\sqrt{x-1} - 2}{x - 5}$ **(2)** $\lim\limits_{x \to \infty} \frac{5x^3 - 4x^2 + 2}{7 - x + |2x|^3}$

2 Use the curve of $f : f(x) = \frac{1}{x}$ to draw the curve of g : $g(x) = \frac{x+1}{x}$ and from the graph determine :

(1) The domain. **(2)** The range.

(3) The function g is one-to-one or not.

(4) The function g is even or odd or neither-nor ?

3 If $f(x) = \begin{cases} 3x - 2 & , \; x \le -2 \\ ax + b & , \; -2 < x < 5 \\ x^2 - 12 & , \; x \ge 5 \end{cases}$ is continuous in $\mathbb{R}$

, find the value of each of a and b

4 If $f(x) = 5^x$, $f(2x - 1) + f(2x + 1) = \frac{26}{25}$, find the value of x

2 Cairo Governorate



El-Khalifa and Mokattam Administration
Al-Baron Language School

First Multiple choice questions

Choose the correct answer from the given ones :

(1) $\lim\limits_{x \to \infty} \frac{x^3 + 5}{x(2x^2 + 3)} =$ ....

(a) $\frac{5}{3}$ (b) $\frac{5}{2}$ (c) $\frac{1}{2}$ (d) 1

(2) The number of solutions of Δ ABC in which m ($\angle$ A) = 60° , a = 7 cm. , c = 9 cm. is ....

(a) one (b) two (c) zero (d) three

(3) If $2 \log y + 4 \log x - 3 \log x y = 2 (1 - \log 2)$ and $x = ky$, then k = ...

(a) 16 (b) 4 (c) 25 (d) 5

(4) If $f(x) = \sqrt{x - 2}$, $g(x) = \sqrt{5 - x}$, then the domain of $(f \circ g)$ = ...

(a) $]-\infty , 0]$ (b) $]-\infty , 1]$ (c) $[1 , \infty[$ (d) $[0 , \infty[$

(5) $\lim_{x \to -3} \frac{\sqrt{x+7} - 2}{x + 3}$ = ...

(a) 1 (b) $\frac{1}{4}$ (c) -3 (d) $\frac{1}{7}$

(6) In Δ ABC , if a = c , then cos C = ...

(a) $\frac{2b}{c}$ (b) $\frac{c}{2b}$ (c) $\frac{b}{2a}$ (d) $\frac{c}{2a}$

(7) The S.S. of $|x + 2| = -x - 2$ in $\mathbb{R}$ is ....

(a) $\varnothing$ (b) $\mathbb{R}$ (c) $]-\infty , -2[$ (d) $]-\infty , -2]$

(8) If $3^{x-5} = 2^{x-5}$, then x = ...

(a) 3 (b) 2 (c) 5 (d) -5

(9) If $x^{\frac{3}{2}} = 64$, then x = ...

(a) $\frac{5}{2}$ (b) 16 (c) 4 (d) 2

(10) If $f(x) = 3x - 1$, $g(x) = x^2$, then $(g \circ f)(-2)$ = ...

(a) -7 (b) 11 (c) -49 (d) 49

(11) The S.S. of $|3 - 2x| \leq 1$ in $\mathbb{R}$ is ....

(a) $[1 , 2]$ (b) $]1 , 2[$ (c) $\mathbb{R} -]1 , 2[$ (d) $\mathbb{R} - [1 , 2]$

(12) If $\frac{2x}{\sin X} = 8$ in Δ XYZ , then the area of its circumcircle equals .... cm^2

(a) 16π (b) 8π (c) 4π (d) 64π

(13) $\lim_{x \to 0} \frac{\sin 2x + 5 \sin 3x}{x}$ = ...

(a) 7 (b) -7 (c) 17 (d) $-\frac{17}{2}$

(14) If $\log(x + 2) + \log(x - 1) = \log 4$, then x = ...

(a) -2 (b) 2 (c) 1 (d) 3

(15) The symmetrical point of the function $f : f(x) = \frac{2x - 1}{x}$ is ....

(a) (1 , 1) (b) (2 , 1) (c) (1 , 2) (d) (0 , 2)

(16) If f is an odd function on $[-3 , 3]$, then $f(X) + f(-X) =$ ....

(a) 6 (b) -6 (c) zero (d) undefined

(17) $\lim\limits_{X \to 2} \frac{X^5 - 32}{X^2 + 3X - 10} =$ ....

(a) $\frac{80}{7}$ (b) $\frac{40}{7}$ (c) $\frac{32}{7}$ (d) $\frac{16}{5}$

(18) The perimeter of Δ ABC is 70 cm. , a = 26 cm. , m ($\angle$ A) = 60°
, then its area = ... cm².

(a) 100 (b) $95\sqrt{3}$ (c) $80\sqrt{7}$ (d) $105\sqrt{3}$

(19) If $f : f(X) = \begin{cases} 2a & X = 1 \\ \frac{X^2 - 1}{X - 1} & X \neq 1 \end{cases}$ is continuous at $X = 1$, then a = ...

(a) zero (b) -2 (c) 4 (d) 1

(20) If $\lim\limits_{X \to 3} \frac{X^2 - k^2}{X + 3} = \frac{4}{3}$, then k could be ....

(a) 2 (b) 9 (c) 1 (d) -3

(21) The S.S. in $\mathbb{R}$ of the inequality $|X - 1| \geq 3$ is ....

(a) $[-2 , 4]$ (b) $]-2 , 4[$ (c) $\mathbb{R} -]-2 , 4[$ (d) $\mathbb{R} - [2 , 4]$

(22) If $f(X) = 2^X$, then the value of X satisfying $f(X + 1) - f(X - 1) = 24$ is ....

(a) 16 (b) 4 (c) 8 (d) 2

(23) The numerical value of the expression $\frac{\log 64}{\log 8}$ is ....

(a) 2 (b) 8 (c) 80 (d) 72

(24) In Δ ABC , $a^2 + b^2 - c^2 =$ ....

(a) cos A (b) ab cos C (c) cos C (d) 2 ab cos C

(25) If $9^X = 2$, $27^y = 4$, then $\frac{X - y}{X + y} =$ ....

(a) $\frac{1}{3}$ (b) $\frac{-1}{7}$ (c) $\frac{3}{4}$ (d) $\frac{-4}{3}$

(26) In Δ ABC , if a = 6 cm. , 2 m ($\angle$ A) = m ($\angle$ B) = 80° , then c = ... cm.

(a) $\frac{6 \sin 40°}{\sin 60°}$ (b) $\frac{\sin 60°}{6 \sin 40°}$ (c) $\frac{\sin 40°}{6 \sin 60°}$ (d) $\frac{6 \sin 60°}{\sin 40°}$

(27) ABCD is a parallelogram , AB = 9 cm. , BC = 13 cm. , AC = 20 cm.
, then the length of $\overline{BD}$ = ... cm.

(a) 5 (b) 10 (c) 205 (d) 4

(28) ABC is a triangle , a = 4 cm. , b = $4\sqrt{3}$ cm. , c = 8 cm. , then the sine of its smallest angle = ...

(a) $\frac{1}{2}$ (b) $\frac{\sqrt{3}}{2}$ (c) 1 (d) zero

Second Essay questions

Answer the following questions :

1 Find : $\lim\limits_{x \to -2} \dfrac{(x+3)^5 - 1}{x^2 - 4}$

2 If $f : f(x) = \begin{cases} \dfrac{(x+3)^5 - 243}{x} & , \quad x \neq 0 \\ k & , \quad x = 0 \end{cases}$ is continuous at x = zero , find the value of k

3 If $f(x) = 7^{x+1}$, find the value of x which satisfies $f(2x - 1) + f(x - 2) = 50$

4 If $f(x) = 3 + \sqrt{x - 1}$, find the invers function

3 **Cairo Governorate**



Hadayek El-Kobba Administration
El-Nokrashy Language School

First Multiple choice questions

Choose the correct answer from the given ones :

(1) The domain of $f : f(x) = \dfrac{1}{|x| - 3}$ is ....

(a) $\{3 , -3\}$ (b) $[-3 , 3]$ (c) $\mathbb{R} - \{-3 , 3\}$ (d) $\mathbb{R} - [-3 , 3]$

(2) The range of $f : f(x) = \dfrac{x^2 - 1}{x - 1}$ is ....

(a) $\mathbb{R}$ (b) $\mathbb{R} - \{-2\}$ (c) $\mathbb{R} - \{2\}$ (d) $\{-1\}$

(3) The S.S. of the equation $|x + 2| + x = -2$ in $\mathbb{R}$ is ....

(a) $\varnothing$ (b) $\mathbb{R}$ (c) $]-\infty , 2[$ (d) $]-\infty , -2]$

(4) If the opposite figure represents the graph of function f

, then $\lim\limits_{x \to 1} f(x) =$ ....

(a) 2

(b) 3

(c) 1

(d) not exist

(5) The S.S. of the equation $x^{\frac{3}{2}} = 8$, then $x =$ ....

(a) 2 (b) 4 (c) 8 (d) 9

(6) The measure of greatest angle of triangle whose side lengths 3 cm. , 5 cm. , 7 cm. equals ....

(a) 150°　(b) 120°　(c) 60°　(d) 30°

(7) $\lim_{x \to a} \frac{a x}{3} = 12$, then a = ...

(a) ± 12　(b) ± 6　(c) 3　(d) – 6

(8) $\lim_{y \to 2} \frac{y^5 - 32}{y - 2} =$ ....

(a) $13 y^4$　(b) 32×2^4　(c) 64　(d) 5×2^4

(9) The domain of the function f where $f(x) = \log_{1-x}(3)$ is ....

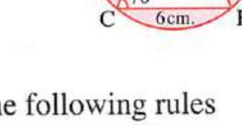
(a) $]-\infty, 0[\cup]0, 1[$　(b) $]-\infty, 1[$

(c) $]1, \infty[$　(d) $]-1, 1[$

(10) $f(x)$ is a polynomial function of third degree and $g(x)$ is polynomial function of fifth degree , then $\lim_{x \to \infty} \frac{g(x)}{x^2 f(x)} =$ ....

(a) ± ∞　(b) zero　(c) Real number ≠ 0　(d) Has no existence

(11) In the opposite figure :



The area of shaded part ≃ .... cm².

(a) 4.37　(b) 26.2

(c) 43.7　(d) 52.6

(12) The one-to-one function between the functions that are defined by the following rules is ....

(a) $f_1(x) = \cos(x)$　(b) $f_2(x) = x^2$　(c) $f_3(x) = x^3$　(d) $f_4(x) = x^4 + x^2$

(13) If $f(x) = \begin{cases} a + \cos x & , x < 0 \\ \frac{\tan 2x}{a x} & , 0 < x < \frac{\pi}{2} \end{cases}$ and $\lim_{x \to 0} f(x)$ exists , then a = ...

(a) 0 or 1　(b) 1 or – 2　(c) 2 or 3　(d) 1 or 2

(14) If ABC is a triangle in which a = 3 cm. , b = 8 cm. , $\sin(A) = \frac{5}{13}$, then the number of triangles could be drawn satisfying these conditions is ....

(a) 0　(b) 1

(c) 2　(d) the information is not enough.

(15) If the curve of the function f intersect the curve f^{-1} at the point $(k , 2k - 3)$, then $k =$ ....

(a) 2 (b) 3 (c) 4 (d) 5

(16) The curve of the function $g : g(x) = x^2 + 4$ is the same curve of the function $f : f(x) = x^2$ by translation of magnitude 4 units in direction of ....

(a) $\overrightarrow{OX}$ (b) $\overrightarrow{OX'}$ (c) $\overrightarrow{Oy}$ (d) $\overrightarrow{Oy'}$

(17) The domain of $f : f(x) = \sqrt{x - 2} + \sqrt{x - 3}$ is ....

(a) $[3 , \infty[$ (b) $[2 , \infty[$ (c) $]2 , \infty[$ (d) $]3 , \infty[$

(18) If $\log(x + 11) = 2$, then $x =$ ....

(a) -9 (b) 22 (c) 89 (d) 91

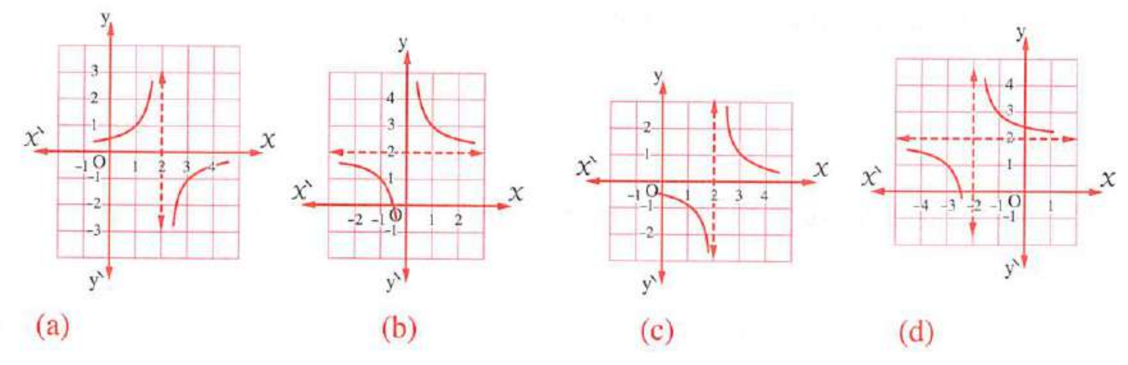
(19) $\lim\limits_{x \to -1} \frac{x^2 - 1}{x^2 + x} =$ ....

(a) 2 (b) 3 (c) 4 (d) -1

(20) In Δ XYZ , If $3 \sin(X) = 4 \sin(Y) = 2 \sin(Z)$, then $x : y : z =$ ....

(a) 2 : 3 : 4 (b) 6 : 4 : 3 (c) 3 : 4 : 6 (d) 4 : 3 : 6

(21) If $f(x) = \frac{1}{x - 2}$, then the graph represents the function f is ....



(a) (b) (c) (d)

(22) If $\angle$ A supplements $\angle$ C , then $\cos(A) + \cos(C) =$ ....

(a) 1 (b) zero (c) $\frac{1}{2}$ (d) -1

(23) $\frac{1}{1 + \log_b a + \log_b c} + \frac{1}{1 + \log_c a + \log_c b} + \frac{1}{1 + \log_a b + \log_a c} =$ ....

(a) $\log_a bc$ (b) $\log_b ac$ (c) $\log_c ab$ (d) 1

(24) If f is an odd function , then $\frac{5 f(x) + 2 f(-x)}{4 f(x)} =$ ....

(a) $\frac{7}{4}$ (b) $\frac{3}{4}$ (c) $\frac{1}{2}$ (d) $\frac{5}{4}$

(25) The domain of the function $f : f(X) = \dfrac{5}{\sqrt{X-1}-3}$ is ....

(a) $[1 , \infty]$ (b) $[1 , \infty[- \{3\}$ (c) $[1 , \infty[- \{10\}$ (d) $[-3 , \infty[$

(26) In the opposite figure :

ABCD is a rectangle , DC = 6 cm. , BC = 8 cm. , BE = 5 cm.

, then AE $\simeq$ .... cm.

(a) $\sqrt{93}$ (b) $\sqrt{97}$

(c) 10 (d) $\sqrt{103}$

(27) If $f : f(X) = \begin{cases} \dfrac{1-\cos(X)+\sin(X)}{1-\cos(X)-\sin(X)} & , X > 0 \\ a & , X \leq 0 \end{cases}$ is continuous at $X = 0$

, then a = ...

(a) 2 (b) -1 (c) 3 (d) 4

(28) In Δ XYZ if $X = y$, then $\cos(X) =$ ....

(a) $\dfrac{2y^2}{z}$ (b) $\dfrac{z}{2y}$ (c) $\dfrac{z}{4X}$ (d) $\dfrac{y}{2X}$

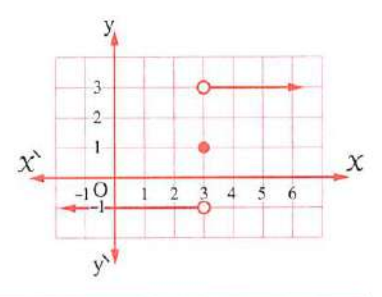
Second Essay questions

Answer the following questions :

1 Graph the function $f : f(X) = \begin{cases} X^2 & , X > 0 \\ -2X & , X < 0 \end{cases}$ and from the graph find the domain , range and monotonicity and it's type (Even , odd , neither even nor odd)

2 If $f(X) = 2^X$, find the value of X that satisfies the equation $f(X+1) - f(X-1) = 24$

3 **From the opposite figure , find each of the following :**



(1) $f(3)$

(2) $\lim\limits_{X \to 3^-} f(X)$

(3) $\lim\limits_{X \to 3} f(X)$

4 **From the opposite figure , find :** m (∠ BAE)

4 Giza Governorate  Dokki Educational Administration
Narmer Language School

First Multiple choice questions

Choose the correct answer from the given ones :

(1) If $x^{\frac{3}{2}} = 8$, then $x =$ ....

(a) 2 (b) 4 (c) 8 (d) 9

(2) If $2^{x+1} + 2^{x+3} = 80$, then $x =$ ....

(a) 3 (b) 10 (c) 8 (d) 2

(3) The S.S. of the equation : $2^{2x} - 12 \times 2^{x} + 2^{5} = 0$ is ....

(a) $\{2\}$ (b) $\{3\}$ (c) $\{3 , 2\}$ (d) $\varnothing$

(4) If $\log_3 x \times \log_2 3 = 5$, such that $x \in \mathbb{R}^+$, then $x =$ ....

(a) 2 (b) 3 (c) 5 (d) 32

(5) If A is the vertex point of the curve $f(x) = x^2$, B is the vertex point of the curve $g(x) = |x - 3| + 4$, then AB = ... unit length.

(a) 3 (b) 4 (c) 5 (d) 25

(6) $\lim\limits_{x \to \infty} \frac{7x^{-2} + 5x^{-1} - 1}{4x^{-2} + 3x^{-1} + 2} =$ ....

(a) $\frac{7}{4}$ (b) $\frac{5}{3}$ (c) $-\frac{1}{2}$ (d) ∞

(7) $\lim\limits_{x \to 4} \frac{x^2 + 16k}{x - 4}$ exists when k = ...

(a) -2 (b) -1 (c) 1 (d) 2

(8) Δ ABC in which m ($\angle$ A) = 80° , m ($\angle$ B) = 60° and c = 12 cm. , then a = ...

(a) $\frac{12 \sin 80°}{\sin 40°}$ (b) $\frac{12 \sin 80°}{\sin 60°}$ (c) $\frac{12 \sin 80°}{\sin 80°}$ (d) $\frac{12 \cos 80°}{\cos 40°}$

(9) In Δ ABC m ($\angle$ A) = 30° , then a = ... , r is a radius of its circumcircle.

(a) 2 r (b) r (c) $\frac{r}{2}$ (d) r^2

(10) If $x = 5 + 2\sqrt{6}$, then : $\log\left(x + \frac{1}{x}\right) =$ ....

(a) 1 (b) 5 (c) 10 (d) 2

(11) The S.S. of the inequality : $\sqrt{x^2 - 10x + 25} \leq 3$, in $\mathbb{R}$ is ....

(a) $\{2 , 8\}$ (b) $[2 , 8]$ (c) $]2 , 8[$ (d) $\mathbb{R} - \{2 , 8\}$

(12) If $x = \log 2$, $y = \log 5$, then $x + y =$ ....

(a) 1 (b) 5 (c) 7 (d) 10

(13) The function $f : f(X) = (X-2)^2 + 1$, is decreasing on the interval ....

(a) $]2 , \infty[$ (b) $]-\infty , 2[$ (c) $]1 , \infty[$ (d) $]-\infty , 1[$

(14) The domain of $f : f(X) = \log_{(1-X)} X$, is ....

(a) $X > 0$ (b) $X < 1$ (c) $0 < X < 1$ (d) $0 \le X \le 1$

(15) $f(X) = \begin{cases} 3X - 2 & , X > -2 \\ kX - 6 & , X < -2 \end{cases}$, $\lim_{X \to -2} f(X)$ exists , then k = ...

(a) -2 (b) -1 (c) 1 (d) 2

(16) $\lim_{X \to 0} \frac{2X^2 + \tan 3X}{5X + \sin 7X} =$ ....

(a) $\frac{5}{12}$ (b) $\frac{1}{4}$ (c) $\frac{7}{12}$ (d) $\frac{3}{7}$

(17) ABC is a triangle in which a = 23 cm. , b = 15 cm. and its perimeter = 70 cm. , then measure of the greatest angle in the triangle equals ....

(a) $77° 43'$ (b) $113° 2'$ (c) $131° 2'$ (d) $150°$

(18) If $f(X) = \log_c (7X + 1)$ and $f^{-1}(3) = 1$, then c = ...

(a) $\frac{1}{3}$ (b) $\frac{1}{2}$ (c) 1 (d) 2

(19) If $f(X) = 3^{X+1}$, then $\frac{f(X+2)}{f(X-2)} + \frac{f(2X+1)}{f(2X-1)} =$ ....

(a) 27 (b) 81 (c) 90 (d) 243

(20) If $f(X) = \sqrt{X-2}$, $g(X) = \sqrt{5-X}$, then domain of $\left(\frac{g}{f}\right)(X)$ is ....

(a) $[2 , 5]$ (b) $]2 , 5]$ (c) $[2 , 5[$ (d) $]2 , 5[$

(21) The symmetry point of the function $f : f(X) = 1 - \frac{1-2X}{X}$ is ....

(a) $(0 , -1)$ (b) $(0 , 1)$ (c) $(0 , 3)$ (d) $(1 , 0)$

(22) $\lim_{X \to 1} \frac{X^2 - X^{-2}}{X^3 - X^{-1}} =$ ....

(a) zero (b) 1 (c) 2 (d) -2

(23) $\lim_{X \to 0} \frac{\sin \pi X}{3X} =$ ....

(a) $\frac{1}{3}$ (b) 2π (c) π (d) $\frac{\pi}{3}$

(24) $\lim_{X \to 1} \frac{1 - \sqrt[n]{X}}{1 - \sqrt[m]{X}} =$ ....

(a) 1 (b) $\frac{n}{m}$ (c) -1 (d) $\frac{m}{n}$

(25) $\lim_{X \to 0} \frac{1 - \tan X}{\sin X - \cos X} =$ ....

(a) 1 (b) -1 (c) zero (d) 2

(26) In Δ ABC if $2 \sin A = 3 \sin B = 4 \sin C$, then : a : b : c = ...

(a) 2 : 3 : 4 (b) 6 : 4 : 3 (c) 3 : 4 : 2 (d) 4 : 3 : 6

(27) In Δ ABC if $a^2 + b^2 - c^2 = \sqrt{3}\, a\, b$, then m ($\angle$ C) = ...

(a) 30° (b) 60° (c) 12° (d) 150°

(28) If the length of the radius of the circumcircle of the triangle ABC equal 6 cm.

, then $\frac{2\,a}{\sin A}$ = ...

(a) 6 (b) 12 (c) 18 (d) 24

Second Essay questions

Answer the following questions :

1 [a] **Find :** $\lim\limits_{x \to 9} \frac{\sqrt{x} - 3}{x - 9}$

[b] If $\lim\limits_{x \to 1} \left(\frac{x^2 + a\,x + b}{x - 1}\right) = 5$, find the value of each of a and b

2 If each of the two functions f , g where $f(x) = 2\,x + a$, $g(x) = b\,x + 3$ is an inverse function to the other , then find the value of each of a and b

3 If the function $f : f(x) = \begin{cases} x^2 + b\,x + 3 & , \quad x < 1 \\ a\,x + b & , \quad x \ge 1 \end{cases}$ is continuous at $x = 1$, $f(1) = 7$

find the value of each of a and b

4 Find graphically in $\mathbb{R}$ the solution set of the following inequality

, then verify the result algebraically : $|x - 1| < 2$

5 **Giza Governorate**  6th October Directorate
Om El Mo'emeneen School

First Multiple choice questions

Choose the correct answer from the given ones :

(1) The vertex point of the curve of the function $f : f(x) = (2 - x)^2 + 3$ is ....

(a) (2 , 3) (b) (2 , – 3) (c) (– 2 , 3) (d) (– 2 , – 3)

(2) The domain of the function $f : f(x) = \frac{\sqrt{x - 2}}{x - 3}$ is ....

(a) $\mathbb{R}$ (b) $\{3\}$ (c) $[2 , \infty[$ (d) $[2 , \infty[- \{3\}$

(3) The diameter length of the circumcircle of the equilateral triangle ABC whose side length $5\sqrt{3}$ cm. is ....

(a) $5\sqrt{3}$ (b) $10\sqrt{3}$ (c) 10 (d) 5

(4) If $\lim\limits_{x \to \infty} \frac{a x + 6}{2 x + 7} = 4$, a $\in \mathbb{R}$, then a = ...

(a) 2 (b) 4 (c) 6 (d) 8

(5) The type of function $f : f(x) = \frac{\sin x}{x}$ is ....

(a) even. (b) odd.

(c) neither even nor odd. (d) one - to - one.

(6) The curve of $f(x) = x^2 + 4$ is the same curve of $g(x) = x^2$ by translation 4 units in direction of ....

(a) $\overrightarrow{Ox}$ (b) $\overrightarrow{Ox'}$ (c) $\overrightarrow{Oy}$ (d) $\overrightarrow{Oy'}$

(7) The measure of the greatest angle in the triangle whose side lengths are 3 cm. , 5 cm. , 7 cm. is ....

(a) 150° (b) 120° (c) 60° (d) 30°

(8) $\lim\limits_{x \to 2} \frac{x^5 - 32}{x^3 - 8} =$ ....

(a) 4 (b) $\frac{5}{3}$ (c) zero (d) $6\frac{2}{3}$

(9) If $f(x) = 4x - 5$, $g(x) = 3^x$, then $(f \circ g)(2) =$ ....

(a) 3 (b) 9 (c) 27 (d) 31

(10) If $f(x) = 7x$, then $f^{-1}(x) =$ ....

(a) $7x$ (b) $\frac{x}{7}$ (c) $\frac{7}{x}$ (d) $7 - x$

(11) If $f : f(x)$ is an odd function , a $\in$ its domain , then $f(a) + f(-a) =$ ....

(a) $2f(a)$ (b) $2f(-a)$ (c) zero (d) $f(a)$

(12) $\lim\limits_{x \to 3} \frac{x^2 - 7x + 12}{x - 3} =$ ....

(a) 1 (b) -1 (c) 7 (d) -2

(13) If the function $f : f(x) = \begin{cases} \frac{x^2 - 9}{x - 3} & , x \neq 3 \\ 2a & , x = 3 \end{cases}$ is continuous at $x = 3$, then a = ...

(a) 2 (b) $\frac{3}{2}$ (c) -3 (d) 3

(14) If $\log x + \log 5 = 2$, then $x =$ ....

(a) 3 (b) 8 (c) 17 (d) 20

(15) $\lim\limits_{x \to 0} 5x \csc 2x =$ ....

(a) $\frac{5}{2}$ (b) 10 (c) $\frac{2}{5}$ (d) zero

(16) In Δ ABC , b = 2 cm. , c = 2.5 cm. , $\cos A = \frac{2}{5}$, then Δ ABC will be .... triangle.

(a) right-angled (b) an isosceles (c) equilateral (d) scalene

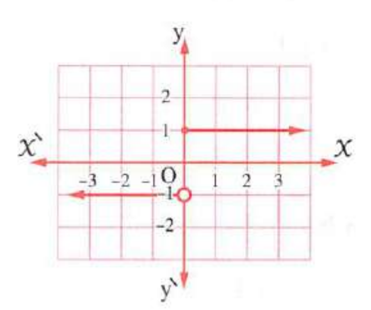
(17) $\lim_{x \to \frac{\pi}{2}} (2x - \cos x) =$ ....

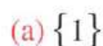
(a) zero (b) 2 (c) π (d) $\frac{\pi}{2}$

(18) If $\log_x (x + 6) = 2$, then $x =$ ....

(a) $\{3 , -2\}$ (b) $\{3\}$ (c) $\{3 , 1\}$ (d) $\{6 , 1\}$

(19) Range of the function which represented in the opposite figure is ....




(a) $\{1\}$

(b) $\{1 , -1\}$

(c) $\{-1\}$

(d) $\mathbb{R}$

(20) In Δ DEH , if m ($\angle$ D) = 30° , e = $15\sqrt{3}$ cm. , m ($\angle$ E) = 60° , then d = ... cm.

(a) 30 (b) 45 (c) 15 (d) 60

(21) The solution set of the inequality : $\sqrt{x^2 - 4x + 4} > 0$ in $\mathbb{R}$ is ....

(a) $\mathbb{R} - \{2\}$ (b) $\mathbb{R} - \{-2\}$ (c) $\mathbb{R}$ (d) $\varnothing$

(22) Number of possible solutions of Δ ABC where m ($\angle$ A) = 60° , b = 3 cm. , a = 5 cm. is ....

(a) 1 (b) 2

(c) zero (d) infinite number of triangles.

(23) $\lim_{x \to 0} \frac{\sqrt{x+1} - 1}{x} =$ ....

(a) zero (b) $\sqrt{2}$ (c) $\frac{1}{2}$ (d) does not exist.

(24) The curve of the even function is symmetric about the straight line ....

(a) $y = x$ (b) $\overleftrightarrow{yy'}$ (c) $\overleftrightarrow{xx'}$ (d) $y = -x$

(25) The value of $\frac{\log 64}{\log 8} =$ ....

(a) 2 (b) 8 (c) 80 (d) 72

(26) The function $f : f(x) = a^x$ is increasing if ....

(a) a > 0 (b) a > 1 (c) a = 1 (d) 0 < a < 1

(27) Δ LMN in which m ($\angle$ L) = 30° , MN = 7 cm. , then the length of the diameter of circumcircle of Δ LMN = ... cm.

(a) 14 (b) 7 (c) 3.5 (d) $\frac{14}{\sqrt{3}}$

(28) $\lim\limits_{X \to 0} \frac{(X+2)^5 - 32}{X} =$ ....

(a) 25 (b) 64 (c) 80 (d) 100

Second | Essay questions

Answer the following questions :

1 Find the values of m which makes the function $f : f(X) = \frac{X+3}{X^2 + mX + 9}$ continuous on $\mathbb{R}$

2 If $2\sqrt[3]{X^5} = \sqrt{y^3} = 64$, **find the value of :** $\sqrt[3]{X} + \sqrt{y}$

3 Draw the curve of the function f where $f(X) = 1 - |X + 1|$, $X \in \mathbb{R}$, then from the graph determine the range , the type of the function whether it is even , odd or neither even nor odd and discuss the monotony of the function.

4 **Find :** (1) $\lim\limits_{X \to 2} \frac{X^2 - 4}{X^2 - 5X + 6}$ (2) $\lim\limits_{X \to -1} \frac{X^3 - 7X - 6}{X^3 + 3X^2 + 2X}$

6 Giza Governorate



Awseem Educational Directorate
Mathematics Inspection

First | Multiple choice questions

Choose the correct answer from the given ones :

(1) If $f(X) = X^2 + 6$, $g(X) = 3X$, then $(f \circ g)(3) =$ ....

(a) 80 (b) 82 (c) 87 (d) 90

(2) If f is an even function , $2 \in$ the domain of f then $f(2) + f(-2) =$ ....

(a) 0 (b) 4 (c) 2 (d) $2f(2)$

(3) Which of the following functions is a one-to-one function ?

(a) $f(X) = \cos X$ (b) $g(X) = X^2$ (c) $h(X) = X^3$ (d) $k(X) = X^4 + X^2$

(4) If $f(X) = 5$, then the domain of the function f is ....

(a) $\mathbb{R}$ (b) $\mathbb{R}^+$ (c) $\{5\}$ (d) $\mathbb{R} - \{5\}$

(5) The curve of the function $f : f(X) = |X + 3|$ is the same as the curve of the function $g(X) = |X|$ after translation of magnitude 3 units in the direction of ....

(a) $\overrightarrow{OX}$ (b) $\overrightarrow{OX'}$ (c) $\overrightarrow{Oy}$ (d) $\overrightarrow{Oy'}$

(6) The S.S. of the equation : $| x - 2 | \le - 4$ is ....

(a) $]-2 , 6[$ (b) $[-2 , 6]$ (c) $\mathbb{R}$ (d) $\varnothing$

(7) If $| x | - 4 = 0$, then $x =$ ....

(a) 4 (b) ± 4 (c) 2 (d) ± 2

(8) If $2^{x+5} = 8$, then $x =$ ....

(a) 2 (b) -2 (c) 3 (d) -3

(9) If $3^{x+1} = 4^{x+1}$, then $x =$ ....

(a) 1 (b) -1 (c) zero (d) 2

(10) If $3^{x} = 2$, $2^{y} = 9$, then $x\,y =$ ....

(a) 18 (b) 8 (c) 2 (d) 3

(11) If $4\,x^{5} = 128$, then $x =$ ....

(a) 2 (b) 4 (c) -2 (d) ± 2

(12) If $f : f(x) = a^{x}$ is an exponential function then $a \in$ ....

(a) $\mathbb{R}$ (b) $\mathbb{R}^{+}$ (c) $\mathbb{R}^{-}$ (d) $\mathbb{R}^{+} - \{1\}$

(13) If $\log (x + 11) = 2$, then $x =$ ....

(a) -9 (b) 22 (c) 89 (d) 100

(14) $\text{Log}_8 \log_2 \log_3 (x - 4) = \frac{1}{3}$, then $x =$ ....

(a) 8 (b) 48 (c) 90 (d) 85

(15) $\lim\limits_{x \to 0} (3\,a) =$ ....

(a) zero (b) 3 (c) 12 (d) 3 a

(16) If $\lim\limits_{x \to 2} \frac{x^2 - 2a}{x - 2}$ exists , then a = ...

(a) -1 (b) 1 (c) 2 (d) 4

(17) $\lim\limits_{x \to 2} \frac{2\,x^6 - 128}{x^2 - 4} =$ ....

(a) 80 (b) 96 (c) 112 (d) 128

(18) $\lim\limits_{x \to \infty} (3\,x^{-5} + 4\,x^{-2} + 5) =$ ....

(a) 5 (b) ∞ (c) 12 (d) zero

(19) $\lim\limits_{x \to 0} (3\,x \csc 2\,x) =$ ....

(a) 6 (b) $\frac{3}{2}$ (c) $\frac{2}{3}$ (d) does not exist

(20) In Δ ABC , if a = 5 cm. , b = 4 cm. and c = 3 cm. , then m ($\angle$ A) = ...°

(a) 60 (b) 90 (c) 30 (d) 120

(21) $\lim\limits_{h \to 0} \frac{(x+h)^7 - x^7}{h} =$ ....

(a) x^7 (b) $7x^6$ (c) zero (d) 1

(22) A circle of diameter length 20 cm. passes through the vertices of the acute angled triangle ABC in which BC = 10 cm. , then m (∠ A) = ...°

(a) 30 (b) 60 (c) 45 (d) 150

(23) In triangle XYZ if : 3 sin X = 4 sin Y = 2 sin Z then $x : y : z =$ ....

(a) 2 : 3 : 4 (b) 6 : 4 : 2 (c) 4 : 3 : 6 (d) 3 : 4 : 6

(24) If the radius length of the circumcircle of triangle XYZ is r , then $\frac{y}{2 \sin Y} =$ ....

(a) 4r (b) 3r (c) 2r (d) r

(25) In triangle ABC : $b^2 + c^2 - a^2 = 2bc \times$ ....

(a) sin B (b) cos A (c) sin A (d) cos B

(26) In triangle ABC if : $\cos B = \frac{c}{2a}$, then triangle ABC is .... triangle.

(a) scalene (b) right angled (c) isosceles (d) equilateral

(27) The number of solutions when solving triangle ABC in which m (∠ A) = 112° , a = 7 cm. , b = 4 cm. is ....

(a) unique solution (b) 2 solutions (c) no solution (d) 3 solutions

(28) ABC is a triangle of perimeter 24 cm. and sin A + sin B = 3 sin C , then c = ...

(a) 4 (b) 6 (c) 8 (d) 9

Second Essay questions

Answer the following questions :

1 Draw the graph of the function $f : f(x) = x|x|$ and deduce from the graph its range and its type of being odd , even , or otherwise.

2 **Find the S.S. of the equation :** $\log_3 (x-1) + \log_3 (x+1) = \log_3 8$

3 **Find :** (1) $\lim\limits_{x \to 4} \frac{2x - 8}{x^2 - x - 12}$ (2) $\lim\limits_{x \to 1} \frac{x^3 - 2x + 1}{x^2 + x - 2}$

4 Discuss the continuity of the function $f : f(x) = \begin{cases} \frac{x^7 - 128}{x^4 - 16} & , x \neq 2 \\ 14 & , x = 2 \end{cases}$ When $x = 2$

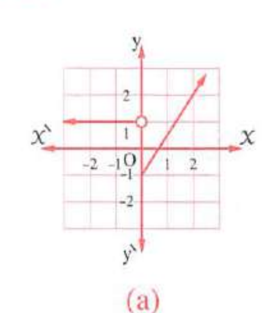
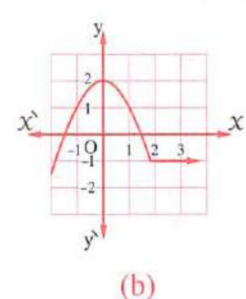
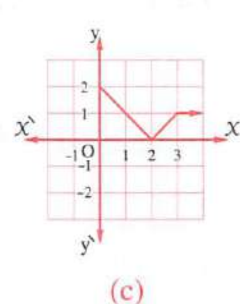
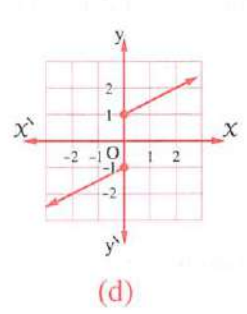


7 Alexandria Governorate East Educational Zone

First Multiple choice questions

Choose the correct answer from the given ones :

(1) Which of the following graphs does not represent a function ?

(a) (b) (c) (d)

(2) If $f(X) = 3X + 1$, $g(X) = X^2 - 5$, then $(g \circ f)(-3) =$ ....

(a) -8 (b) 4 (c) 13 (d) 59

(3) $\lim_{X \to 0} \frac{\sqrt{X+1} - 1}{X} =$ ....

(a) zero (b) $\sqrt{2}$ (c) $\frac{1}{2}$ (d) has no existence.

(4) **In the opposite figure :**

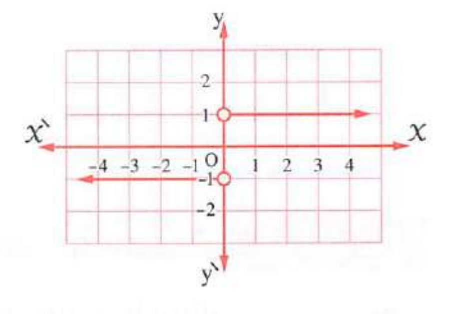
The range of the function is ....

(a) $\{1\}$

(b) $\{-1\}$

(c) $\{1 , -1\}$

(d) $\mathbb{R}$



(5) The domain of the function $f : f(X) = \frac{1}{|X| - 3}$ is ....

(a) $\{3 , -3\}$ (b) $[-3 , 3]$ (c) $\{4\}$ (d) $\mathbb{R} - \{3 , -3\}$

(6) The curve of the function $f : f(X) = 5^X$ intersects the y-axis at the point ....

(a) $(0 , 1)$ (b) $(1 , 0)$ (c) $(0 , 3)$ (d) $(3 , 0)$

(7) If $3^X = 5$, then $X =$ ....

(a) $\log_3 2$ (b) $\log_3 5$ (c) $\log_5 3$ (d) $\frac{5}{3}$

(8) DEF is a triangle in which m ($\angle$ D) = 80° , and m ($\angle$ E) = 60° , if f = 12 cm.

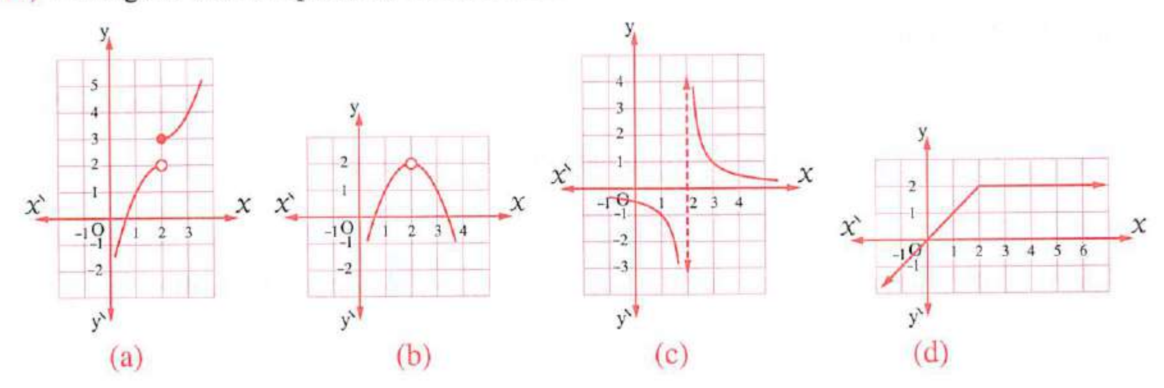
, then d = ...

(a) $\frac{12 \sin 80°}{\sin 40°}$ (b) $\frac{12 \sin 80°}{\sin 60°}$ (c) $\frac{12 \sin 40°}{\sin 80°}$ (d) $\frac{12 \cos 80°}{\cos 40°}$

(9) $\lim\limits_{x \to 2} 3a^2 = \text{..............}$

(a) 3 (b) 6 (c) 12 (d) $3a^2$

(10) The figure which represents a continuous function when $x = 2$ is ....



(11) The one-to-one function between the functions that are defined by the following rules is ....

(a) $f_1(x) = \cos x$ (b) $f_2(x) = x^2$ (c) $f_3(x) = x^3$ (d) $f_4(x) = x^4 + x^2$

(12) In Δ XYZ , if $x = y$, then $\cos X = \text{..............}$

(a) $\frac{2y^2}{z}$ (b) $\frac{z}{2y}$ (c) $\frac{z}{4x}$ (d) $\frac{y}{2x}$

(13) If $\log(x + 11) = 2$, then $x = \text{..............}$

(a) -9 (b) 22 (c) 89 (d) 91

(14) The perimeter of Δ ABC , in which b = 11 cm. , m ($\angle$ A) = 67° , m ($\angle$ C) = 46° equals .... (to the nearest cm.)

(a) 31 (b) 38 (c) 2 (d) 27

(15) If $f(x) = 5$, then the domain of the function f is ....

(a) $\mathbb{R}$ (b) $\mathbb{R}^+$ (c) $\{5\}$ (d) $\mathbb{R} - \{5\}$

(16) The point of symmetry of the function $f : f(x) = 1 - (x + 2)^3$ is ....

(a) $(-1 , 2)$ (b) $(1 , -2)$ (c) $(-2 , -1)$ (d) $(-2 , 1)$

(17) In Δ XYZ the expression $\frac{x^2 + y^2 - z^2}{2xy}$ equals ....

(a) cos X (b) cos Y (c) cos Z (d) sin Z

(18) $\lim\limits_{x \to 0} \frac{2x}{\sin 3x} = \text{..............}$

(a) $\frac{2}{3}$ (b) $\frac{3}{2}$ (c) 6 (d) has no existence.

(19) If $f(x) = \begin{cases} 3x - 1 & , \quad x \neq 2 \\ 6 & , \quad x = 2 \end{cases}$, then $\lim\limits_{x \to 2} f(x) = \text{..............}$

(a) -5 (b) 5 (c) 6 (d) does not exist.

(20) The number of possible solutions of Δ ABC in which m ($\angle$ C) = 115° , c = 12 cm. , a = 9 cm. is ....

(a) 1 (b) 2 (c) 3 (d) zero

(21) In Δ XYZ , 2 r sin X = ...

(a) z (b) y (c) x (d) area of Δ XYZ

(22) The function $f : f(x) = \sqrt{x+3}$, its domain equals ....

(a) $]-3 , \infty[$ (b) $]-\infty , 3[$ (c) $[3 , \infty[$ (d) $[-3 , \infty[$

(23) The axis of symmetry of the function $f : f(x) = x^2 - 1$ is the straight line ....

(a) $x = 1$ (b) $x = 0$ (c) $y = 1$ (d) $y = 0$

(24) If r is the length of the radius of the circumcircle of the triangle XYZ , then $\frac{y}{2 \sin Y}$ = ...

(a) r (b) 2 r (c) $\frac{1}{2}$ r (d) 4 r

(25) If f is a function where $f(x) = 7x$, then $f^{-1}(x)$ = ...

(a) $7x$ (b) $\frac{x}{7}$ (c) $\frac{7}{x}$ (d) $7 - x$

(26) The image of the point (3 , – 1) by reflection in the straight line $y = x$ is ....

(a) (3 , – 1) (b) (– 3 , – 1) (c) (– 1 , 3) (d) (3 , 1)

(27) If $5^x = 2$, then 25^x = ...

(a) 10 (b) 625 (c) 4 (d) 2

(28) If log 3 = x , log 4 = y , then log 12 = ...

(a) $x + y$ (b) xy (c) $x - y$ (d) $\log x + \log y$

Second Essay questions

Answer the following questions :

1 **Find the S.S. of the equation :** $\log_x 81 = 4$

2 **Find in $\mathbb{R}$ the solution set of the equation :** $|2x - 3| = 5$

3 **Find the solution set of the equation :** $2 \times 4^{x-3} = 16$ in $\mathbb{R}$

4 **Find the value of :** $\lim\limits_{x \to \infty} \frac{5 + x^{-2}}{3x^{-2} + 1}$



8 El-Kalyoubia Governorate

First Multiple choice questions

Choose the correct answer from the given ones :

(1) ABC is a triangle where cos (A + B) = ...

(a) cos A + cos B (b) sin A + sin B (c) cos C (d) – cos C

(2) $\lim\limits_{x \to \infty} \frac{x^2 - 5x}{2x + 3x^2} =$ ....

(a) 3 (b) 6 (c) 9 (d) $\frac{1}{3}$

(3) $\lim\limits_{x \to 0} \frac{2x^2 + \tan 3x}{5x + \sin 7x} =$ ....

(a) $\frac{5}{12}$ (b) $\frac{1}{4}$ (c) $\frac{7}{12}$ (d) $\frac{3}{7}$

(4) Δ ABC in which a = 23 cm. , b = 15 cm. and its perimeter = 70 cm. , then measure of the biggest angle in triangle equals ....

(a) 77° 43̀ (b) 113° 2̀ (c) 131° 2̀ (d) 150°

(5) If f is increasing function on the interval $]1, \infty[$, then $g(x) = f(x + 2)$ is increasing on ....

(a) $]-1, \infty[$ (b) $]-\infty, 1[$ (c) $]-2, \infty[$ (d) $]-3, \infty[$

(6) If $f(x) = 3^{x+1}$, then $\frac{f(x+2)}{f(x-2)} + \frac{f(2x+1)}{f(2x-1)} =$ ....

(a) 27 (b) 81 (c) 90 (d) 243

(7) $\lim\limits_{x \to \infty} \frac{2x^2 + 3x - 1}{4x - 5x^2 + 2} =$ ....

(a) $\frac{-3}{5}$ (b) $-\frac{2}{5}$ (c) $\frac{1}{2}$ (d) $\frac{3}{4}$

(8) Δ LMN in which m ($\angle$ M) = 60° , ℓ = 20 cm. has two solutions when m = ... cm. from the following.

(a) 21 (b) 15 (c) $10\sqrt{3}$ (d) 18

(9) If $f(x) = \frac{1}{x - 2} + 3$, then domain of $f^{-1} =$ ....

(a) $\mathbb{R} - \{3\}$ (b) $\mathbb{R} - \{2\}$ (c) $\mathbb{R} - \{2, 3\}$ (d) $\mathbb{R}$

(10) $f(x) = \frac{6 \cos x}{2x - \pi}$ to be continuous at $x = \frac{\pi}{2}$, then $f\left(\frac{\pi}{2}\right) =$ ....

(a) – 3 (b) 3 (c) $\frac{\pi}{2}$ (d) π

(11) $\lim\limits_{x \to 1} \frac{\sqrt[5]{x} + \sqrt[3]{x} - 2}{x^2 - 1} =$ ....

(a) $\frac{4}{15}$ (b) $\frac{8}{15}$ (c) $\frac{6}{15}$ (d) $\frac{1}{3}$

(12) If radius length of the circumcircle of Δ XYZ equals 4 cm. , then $\frac{y\,z}{\sin y \sin z} = \ldots\ldots$

(a) 8 (b) 16 (c) 32 (d) 64

(13) If $4^{x} = 3$, $8^{y} = 9$, then $\frac{x+y}{x-y} = \ldots\ldots$

(a) -7 (b) $\frac{1}{3}$ (c) $\frac{1}{2}$ (d) 7

(14) If $f : f(x) = \begin{cases} \frac{x^2-1}{x-1} & , \quad x \neq 1 \\ k & , \quad x = 1 \end{cases}$ continuous , then k = ...

(a) ∞ (b) 5 (c) 3 (d) 2

(15) $\lim\limits_{x \to \infty} \frac{\sqrt{9x^2} + 5x}{4x+3} = \ldots\ldots$

(a) ∞ (b) 5 (c) 3 (d) 2

(16) The solution set of the inequality : $|2x-6| + |3-x| > 12$ is ......

(a) $]-1 , 7[$ (b) $\mathbb{R} - [-3 , 9]$ (c) $\mathbb{R} - [-1 , 7]$ (d) $]-3 , 9[$

(17) If $2 \log y + 4 \log x - 3 \log x y = 2 (1 - \log 2)$ and $x = k\,y$, then k = ...

(a) 4 (b) 5 (c) 16 (d) 25

(18) **In the opposite figure :**

$\overline{AD} \parallel \overline{BC}$, m ($\angle$ ACB) = 30° , BC = 20 cm.

, m ($\angle$ ADC) = 100° , AD = 12 cm.

, then the area of Δ ABC $\simeq$ ...... cm^2.

D 12cm. A 100° 30° C 20cm. B

(a) 60 (b) 77 (c) 104 (d) 120

(19) If $\log 3 = x$, $\log 5 = y$, then $\log 15 = \ldots\ldots$

(a) $x\,y$ (b) $\frac{x}{y}$ (c) $x + y$ (d) $x - y$

(20) The curve of even function is symmetric about the straight line ......

(a) $y = x$ (b) $\overleftrightarrow{yy}$ (c) $\overleftrightarrow{xx}$ (d) $y = -x$

(21) $\lim\limits_{x \to 16} \frac{\sqrt{x} - 1}{x - 16} = \ldots\ldots$

(a) zero (b) $\frac{1}{2}$ (c) 1 (d) does not exist.

(22) In Δ ABC , m ($\angle$ A) : m ($\angle$ B) : m ($\angle$ C) = 3 : 5 : 4 , then $c^2 : a^2 = \ldots\ldots$

(a) $\sqrt{6} : 2$ (b) 2 : 3 (c) 4 : 3 (d) 3 : 2

(23) The included area between curves of two functions $f : f(x) = |x + 3| - 2$

, g : g (x) = zero is ...... square unit.

(a) 2 (b) 3 (c) 4 (d) 5

(24) If the function $f : f = \begin{cases} x^2 & , x > 2 \\ -x^2 & , x \le 2 \end{cases}$, then the function is decreasing on the interval ....

(a) $]0 , 2[$ (b) $]-\infty , 0[$ (c) $\mathbb{R} - [0 , 2[$ (d) $]0 , \infty[$

(25) The solution set of the equation : $| x + 2 | + x = -2$ in $\mathbb{R}$ is ....

(a) $\varnothing$ (b) $\mathbb{R}$ (c) $]-\infty , -2[$ (d) $]-\infty , -2]$

(26) Measure of the greatest angle in triangle whose side lengths are 3 cm. , 7 cm. and 5 cm. equals ....

(a) 150° (b) 120° (c) 60° (d) 30°

(27) In Δ ABC : $\frac{b^2 + c^2 - a^2}{2 bc} =$ ....

(a) cos A (b) cos B (c) cos C (d) sin A

(28) $\lim\limits_{x \to 0} \frac{\sin 2x \cos 3x}{6x} =$ ....

(a) 1 (b) 3 (c) $\frac{1}{3}$ (d) zero

Second Essay questions

Answer the following questions :

1 **Find in $\mathbb{R}$ the solution set of the inequality :** $| 3x - 2 | \ge 7$

2 **Find in $\mathbb{R}$ the solution set of the equation :** $x^{\frac{4}{3}} - 10 x^{\frac{2}{3}} + 9 = 0$

3 **Find :** $\lim\limits_{x \to -2} \frac{(x + 3)^5 - 1}{x^2 - 4}$

4 ABCD is a quadrilateral in which AB = 27 cm. , BC = 12 cm. , CD = 8 cm. , DA = 12 cm. , AC = 18 cm.

Prove that : $\overrightarrow{AC}$ bisects $\angle$ BAD , then find the area of the shape ABCD

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First Multiple choice questions

Choose the correct answer from the given ones :

(1) If $f(x) = x^2 - 1$, $g(x) = x + 1$, then $(f \circ g)(2) =$ ....

(a) 2 (b) 4 (c) 8 (d) 16

(2) The solution set in $\mathbb{R}$ of : $\sqrt{x^2 - 6x + 9} < 5$ is ....

(a) $]-5 , 5[$ (b) $]-2 , 8[$ (c) $\varnothing$ (d) $\{8\}$

(3) If the diameter length of the circumcircle of an equilateral triangle equals 10 cm. , then the side length of the triangle = ... cm.

(a) $10\sqrt{3}$ (b) $5\sqrt{3}$ (c) 5 (d) 2.5

(4) If f is continuous at $x = 4$, where $f(x) = \begin{cases} k + 3 & , \quad x = 4 \\ \dfrac{x^2 - 16}{x - 4} & , \quad x \neq 4 \end{cases}$, then k = ...

(a) 3 (b) 4 (c) 5 (d) 6

(5) The domain of the function f , where $f(x) = \log_{x-3} 6 - x$ is ....

(a) $[3 , 6]$ (b) $]3 , 6[$ (c) $]3 , 6[- \{4\}$ (d) $]3 , 6[- \{5\}$

(6) If $\sqrt[5]{32^x} = \frac{1}{8}$, then x = ...

(a) -3 (b) 3 (c) -2 (d) 2

(7) In the triangle ABC , $a^2 + b^2 - c^2$ = ...

(a) 2 ac cos B (b) ac cos B (c) ab cos C (d) 2 ab cos C

(8) $\lim\limits_{x \to 0} \frac{\sin x}{x}$ = ... , where x is in degree measure.

(a) 1 (b) $\frac{\pi}{180}$ (c) $\frac{180}{\pi}$ (d) π

(9) If $f(x) = x + 2$, then $f^{-1}(x)$ = ...

(a) $x + 2$ (b) $-x + 2$ (c) $x - 2$ (d) $\frac{\pi}{2}$

(10) The expression $\frac{3 \log 2}{\log 4 + \log 3}$ is equivalent to the expression ....

(a) $\log_7 2$ (b) $\log_3 2$ (c) $\log_7 8$ (d) $\log_{12} 8$

(11) If $\lim\limits_{x \to 2} \frac{x^2 - 4a}{x - 2}$ is exists , then a = ...

(a) 4 (b) 2 (c) -1 (d) 1

(12) If $\frac{\sin A}{3} = \frac{2 \sin B}{5} = \frac{\sin C}{4}$, then a : b : c = ...

(a) 6 : 5 : 8 (b) 8 : 5 : 6 (c) 7 : 2 : 4 (d) 3 : 5 : 4

(13) The point of symmetry of the graph of the function f , where : $f(x) = (x - 1)^3 + 2$ is ....

(a) $(-1 , 2)$ (b) $(2 , -1)$ (c) $(-1 , -2)$ (d) $(1 , 2)$

(14) The curve of the function g : $g(x) = x^2 - 4$, is the same curve of the function $f : f(x) = x^2$ by a translation 4 units in the direction of ....

(a) $\overrightarrow{OX}$ (b) $\overrightarrow{OX'}$ (c) $\overrightarrow{Oy}$ (d) $\overrightarrow{Oy'}$

(15) $\lim\limits_{x \to \infty} \frac{(x + 1)(5x - 2)}{x^2 + 3}$ = ...

(a) 3 (b) 5 (c) ∞ (d) not exists

(16) For the triangle ABC , if ($\angle$ A) is an acute angle , $a \geq b$, then there is .... solution(s).

(a) non (b) 1 (c) 2 (d) an infinite

(17) If the point $(k^2 - 3 , 1)$ is the point of intersection between the function f and its inverse function f^{-1} , then k = ...

(a) 4 (b) ± 2 (c) ± 1 (d) $\pm\sqrt{3}$

(18) The solution set in $\mathbb{R}$ of the equation : $4^X + 2^{X+1} = 8$ is ....

(a) $\{1\}$ (b) $\{1 , -1\}$ (c) $\{1 , -2\}$ (d) $\varnothing$

(19) $\lim\limits_{X \to 1} \frac{(X+1)^5 - 32}{X - 1} =$ ....

(a) 160 (b) 165 (c) 80 (d) 16

(20) If the function f is continuous at $X = 1$, then all of the following are true except ....

(a) $f(1)$ is exists (b) $\lim\limits_{X \to 1} f(X)$ is exists

(c) $f(1) = \lim\limits_{X \to 1} f(X)$ (d) $f(1)^+ \neq f(1)^-$

(21) The range of the function $f : f(X) = \frac{X^2 - 4}{X - 2}$ is ....

(a) $\mathbb{R}$ (b) $\mathbb{R} - \{0\}$ (c) $\mathbb{R} - \{4\}$ (d) $\mathbb{R} - \{2\}$

(22) The solution set in $\mathbb{R}$ of the equation : $|2X - 3| = |X + 2|$ is ....

(a) $\{5 , 3\}$ (b) $\left\{5 , \frac{1}{3}\right\}$ (c) $\left\{\frac{3}{2}\right\}$ (d) $\{-2\}$

(23) $\lim\limits_{X \to 1} \frac{1}{(X - 1)^2} =$ ....

(a) not exists (b) 51 (c) zero (d) ∞

(24) The measure of the greatest angle in the triangle whose side lengths are : 5 cm. , 13 cm. and 12 cm. is ....

(a) $\frac{\pi}{4}$ (b) $\frac{\pi}{2}$ (c) $\frac{2\pi}{3}$ (d) $\frac{\pi}{6}$

(25) From the following functions , $f(X) =$ .... is neither odd nor even

(a) $\sin X$ (b) $\sin 30°$ (c) $X \cos X$ (d) $X^2 + \tan X$

(26) The solution set in $\mathbb{R}$ of the equation : $\log_2 X + \log_2 (X + 1) = 1$ is ....

(a) $\{1 , -1\}$ (b) $\{1 , -2\}$ (c) $\{1\}$ (d) $\{0\}$

(27) $\lim\limits_{X \to 0} \frac{2X + \sin 3X}{\tan 5X} =$ ....

(a) zero (b) 1 (c) 5 (d) $\frac{6}{5}$

(28) In the triangle ABC , if m ($\angle$ A) : m ($\angle$ B) : m ($\angle$ C) = 1 : 2 : 3 , then $a^2 : b^2 =$ ....

(a) 1 : 2 (b) 3 : 1 (c) 2 : 3 (d) 1 : 3

Second | Essay questions

Answer the following questions :

1 Graph the function $f : f(x) = \frac{1}{x-2} + 1$ showing its domain , deduce the range , the monotony.

2 Redefine (if possible) the function $f : f(x) = \frac{x^2 + 2x - 3}{x - 1}$ to be continuous at $x = 1$

3 **Find :** $\lim\limits_{x \to 3} \frac{x - 3}{\sqrt{x+1} - 2}$

4 If $\sqrt[5]{x^3} = 1$, $y^{\frac{3}{4}} = 27$ **, then find the value of :** $\sqrt[3]{x} + \sqrt{y}$

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First | Multiple choice questions

Choose the correct answer from the given ones :

(1) The domain of the function $f : f(x) = \sqrt[3]{x-5}$ is ....

(a) $[5 , \infty[$ (b) $]-\infty , 4[$ (c) $\mathbb{R}$ (d) $\mathbb{R}^+$

(2) If $f(1) = 4$, $g(4) = 7$, then $(g \circ f)(1) =$ ....

(a) 1 (b) 4 (c) 7 (d) 11

(3) The type of the function $f : f(x) = \frac{\sin x}{x}$ is ....

(a) even. (b) odd.

(c) neither even nor odd. (d) one-to-one.

(4) The range of the function $f : [-2 , 3[\longrightarrow \mathbb{R}$, $f(x) = x^2$ is ....

(a) $[4 , 9[$ (b) $\mathbb{R}^+$ (c) $[0 , 9[$ (d) $[0 , 4]$

(5) The curve $y = 3(x-5)^2 + 7$ by translation 3 units in positive direction of x-axis and one unit in negative direction of y-axis is ....

(a) $y = 3(x+8)^2 + 6$ (b) $y = 3(x-8)^2 - 6$

(c) $y = 3(x-8)^2 + 6$ (d) $y = 3(x+8)^2 - 6$

(6) The solution set of the equation $\frac{1}{|x-3|} = \frac{1}{2}$ is .... (where $x \neq 3$)

(a) $\{5\}$ (b) $\{1\}$ (c) $\{5 , 1\}$ (d) $\varnothing$

(7) The solution set in $\mathbb{R}$ for the inequality : $\sqrt{x^2 - 4x + 4} > 0$ is ....

(a) $\mathbb{R} - \{2\}$ (b) $\mathbb{R} - \{-2\}$ (c) $\mathbb{R}$ (d) $\varnothing$

(8) If $2^{x+1} = 8$, then $x =$ ....

(a) 1 (b) 2 (c) 3 (d) 4

(9) The number $(2^{24} + 2^{23} + 2^{22})$ is divisible by ....

(a) 3 (b) 5 (c) 7 (d) 9

(10) If $f(x+1) = 2^{x}$ and $f(a) = 8$, then a = ...

(a) 3 (b) 2 (c) 4 (d) 5

(11) In the exponential function $f : f(x) = a^{x}$, $a > 1$, then $f(x) > 1$ where $x \in$ ....

(a) $\mathbb{R}$ (b) $\mathbb{R}^{+}$ (c) $\mathbb{R}^{-}$ (d) $\mathbb{Z}$

(12) If $f : \mathbb{R} \longrightarrow \mathbb{R}$ where $f(x) = 3x - 4$, then $f^{-1}(x+2) =$ ....

(a) $\frac{x-2}{3}$ (b) $\frac{x+2}{3}$ (c) $\frac{x+4}{3}$ (d) $\frac{x+6}{3}$

(13) If $\log(x + 11) = 2$, then $x =$ ....

(a) -9 (b) 22 (c) 89 (d) 91

(14) If $\log x = z + \log y$, then $x =$ ....

(a) $y \times 10^{z}$ (b) $\frac{z}{y}$ (c) $z - 10^{z}$ (d) $\frac{1}{y} \times 10^{z}$

(15) If the curve of the polynomial function f intersects the x-axis at $x = 3$, then ....

(a) $\lim\limits_{x \to 3} f(x) = 0$ (b) $\lim\limits_{x \to 0} f(x) = 3$ (c) $\lim\limits_{x \to 0} f(x) = 0$ (d) $\lim\limits_{x \to 3} f(x) = 3$

(16) $\lim\limits_{x \to 2} \frac{x^2 + x - 6}{x^2 - 4} =$ ....

(a) $\frac{4}{5}$ (b) $\frac{5}{4}$ (c) $\frac{2}{5}$ (d) $\frac{-2}{5}$

(17) $\lim\limits_{x \to 2} \frac{x^n - a^n}{x - 2} = 32$, then n = ...

(a) 3 (b) 4 (c) 9 (d) 12

(18) $\lim\limits_{x \to -2} \frac{x^7 + 128}{x^4 - 16} =$ ....

(a) 9 (b) -9 (c) -14 (d) 14

(19) $\lim\limits_{x \to \infty} \frac{2x^2 + 1}{x^2 + 1} =$ ....

(a) 0 (b) doesn't exist (c) ∞ (d) 2

(20) $\lim\limits_{x \to 0} \frac{\sin 2x \tan 3x}{4x^2} =$ ....

(a) $\frac{1}{2}$ (b) $\frac{3}{4}$ (c) $\frac{3}{2}$ (d) 6

(21) If $f(x) = \begin{cases} 3x - 1 & , x \neq 2 \\ 6 & , x = 2 \end{cases}$, then $\lim\limits_{x \to 2} f(x) =$ ....

(a) -5 (b) 5 (c) 6 (d) doesn't exist

(22) The function f is continuous at $x = a$ if ....

(a) f (a) exist.
(b) $f(a) = f(a^+) = f(a^-)$
(c) $f(x)$ has not limit at $x \longrightarrow a$
(d) a and c together.

(23) In any ΔXYZ , XY : YZ = ...

(a) sin X : sin Y
(b) sin Y : sin Z
(c) sin Z : sin X
(d) sin Z : sin Y

(24) In ΔABC , a = 27 cm. , m ($\angle$ B) = 82° , m ($\angle$ C) = 56°
, then its surface area = ... cm^2.

(a) 540
(b) 447
(c) 350
(d) 400

(25) In ΔABC , cos (A + B) = ...

(a) $\frac{a^2 + b^2 - c^2}{2\,ab}$
(b) $\frac{a^2 + c^2 - b^2}{2\,ab}$
(c) $\frac{b^2 + c^2 - a^2}{2\,bc}$
(d) $\frac{c^2 - a^2 - b^2}{2\,ab}$

(26) In ΔABC , if m ($\angle$ A) + m ($\angle$ B) = 120° , a = 2 cm. , b = 3 cm.
, then c = ... cm.

(a) 4
(b) 3
(c) $\sqrt{7}$
(d) $\sqrt{5}$

(27) By solving ΔABC in which a = 2 cm. , b = $4\sqrt{2}$ cm. and c = $2\sqrt{5}$ cm. , then cos A = ...

(a) $\frac{3}{\sqrt{10}}$
(b) $\frac{4}{5}$
(c) $\frac{2}{\sqrt{10}}$
(d) $\frac{\sqrt{10}}{5}$

(28) The number of possible solutions of ΔXYZ in which $x = 5$ cm. , y = 6 cm.
, m ($\angle$ X) = 70° equals ....

(a) 0
(b) 2
(c) 1
(d) 3

Second Essay questions

Answer the following questions :

1 **Draw the curve of the function f and determine its range and its monotonicity :**

$$f(x) = \begin{cases} x^2 + 1 & , \; x > 0 \\ -x^2 - 1 & , \; x < 0 \end{cases}$$

2 If $f(x) = 2^x$ **, then prove that :** $\frac{f(x+1)}{f(x-1)} + \frac{f(x-1)}{f(x+1)} = \frac{17}{4}$

3 **Find :** $\lim\limits_{x \longrightarrow 1} \frac{x^3 - 2x + 1}{x^2 + x - 2}$

4 Find the value of k such that the function is continuous at $x = 1$:

$$f(x) = \begin{cases} \frac{\sqrt{x+3} - 2}{x^2 - 1} & , \; x \neq 1 \\ k & , \; x = 1 \end{cases}$$

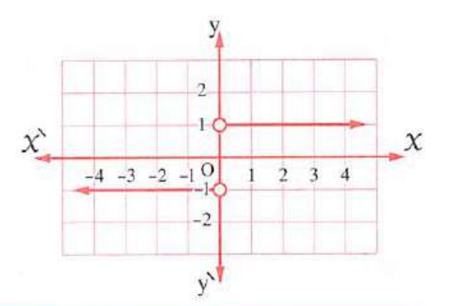
Model 1

Interactive test 1



First Multiple choice questions

Choose the correct answer from the given ones :



1 The range of the given function in the opposite figure is ....

(a) $\{1\}$ (b) $\{1, -1\}$

(c) $\{-1\}$ (d) $\mathbb{R}$

2 If the point $\left(X, \frac{4}{X}\right)$ is the point of intersection between the function f and its inverse function f^{-1}, then $X =$ ....

(a) 2 (b) 4 (c) ± 2 (d) ± 4

3 $\lim_{X \to \infty} \frac{2X+3}{5X^2+4} =$ ....

(a) 2 (b) zero (c) $\frac{3}{4}$ (d) $\frac{2}{5}$

4 In Δ ABC , if $4 \sin A = 3 \sin B = 6 \sin C$, then m ($\angle$ C) $\simeq$ ....

(a) 89° (b) 29° (c) 57° (d) 82°

5 If $f(1) = 3$, $g(3) = 5$, then $(g \circ f)(1) =$ ....

(a) 3 (b) 5 (c) 15 (d) $\frac{3}{5}$

6 The solution set of the equation : $2^{2X} - 12 \times 2^{X} + 2^5 = 0$ in $\mathbb{R}$ is ....

(a) $\{2, 3\}$ (b) $\{2\}$ (c) $\{3\}$ (d) $\{4, 8\}$

7 $\lim_{X \to 0} \frac{(X+2)^5 - 32}{X} =$ ....

(a) 25 (b) 64 (c) 80 (d) 100

8 The number of possible solutions for Δ LMN given that m ($\angle$ L) = 40° , ℓ = 12 cm. , m = 15 cm. is ....

(a) 1 (b) 2

(c) zero (d) infinite solutions.

9 The sum of the roots of the equation : $25^{x} - 12 \times 5^{x} + 27 = 0$ in $\mathbb{R}$ equals ....

(a) $\log_5 12$ (b) 12 (c) $\log_5 27$ (d) 27

---

10 If $x = 5 + 2\sqrt{6}$, then $\log\left(x + \frac{1}{x}\right) =$ ....

(a) 1 (b) $5 - 2\sqrt{6}$ (c) 10 (d) $5 + 2\sqrt{6}$

---

11 ABC is an equilateral triangle , its side length $= 5\sqrt{3}$ cm. , then the diameter length of its circumcircle equals .... cm.

(a) $5\sqrt{3}$ (b) $10\sqrt{3}$ (c) 10 (d) 5

---

12 If $f : \mathbb{R} \longrightarrow \mathbb{R}$, where $f(x) = (a + 1)\, x + b - 2$ and f maps each real number to itself , then (a , b) = ...

(a) (0 , 3) (b) (0 , – 3) (c) (0 , 2) (d) (– 1 , 2)

---

13 If $f(x) = \frac{x^2 - 16}{x - 4}$, $x \neq 4$, then the value of $f(4)$ which makes the function f continuous is ....

(a) undefined. (b) $\lim\limits_{x \to 4} \frac{x^2 - 16}{x - 4}$ (c) zero (d) 16

---

14 The solution set of the equation : $\log_3 x \times \log_2 3 = 5$ in $\mathbb{R}$ is ....

(a) $\{32\}$ (b) $\{5\}$ (c) $\{3\}$ (d) $\{2\}$

---

15 In Δ ABC , m ($\angle$ A) : m ($\angle$ B) : m ($\angle$ C) = 3 : 5 : 4 , then $c^2 : a^2 =$ ....

(a) $\sqrt{6} : 2$ (b) 2 : 3 (c) 4 : 3 (d) 3 : 2

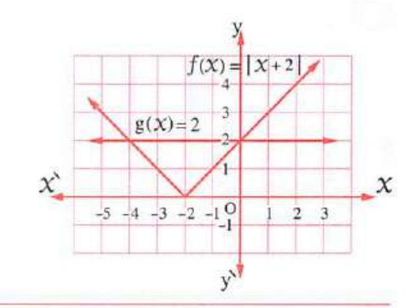
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16 **In the opposite figure :**

The solution set of the inequality $f(x) < g(x)$ in $\mathbb{R}$ is ....

(a) $\{-4 , 0\}$ (b) $[-4 , 0]$

(c) $\mathbb{R} - [-4 , 0]$ (d) $]-4 , 0[$



---

17 The type of the function $f : f(x) = \frac{\sin x}{x}$ is ....

(a) even. (b) odd.

(c) neither odd nor even. (d) both odd and even.

18 $\lim\limits_{x \to 0} \frac{\sin \pi |x|}{4x} =$ ....

(a) $\frac{\pi}{4}$ (b) 1 (c) $\frac{1}{4}$ (d) does not exist.

19 If $x^{\frac{3}{2}} = 8$, then $x =$ ....

(a) 2 (b) 4 (c) 8 (d) 9

20 If $\lim\limits_{x \to 1} \frac{2x + a}{x + 1} = 5$, then a = ...

(a) 2 (b) 5 (c) 8 (d) 10

21 In any triangle XYZ , $x^2 + y^2 - 2xy \cos Z =$ ....

(a) x^2 (b) y^2 (c) z^2 (d) z

22 The solution set in $\mathbb{R}$ of the inequality : $\sqrt{4x^2 - 12x + 9} \leq 9$ equals ....

(a) $]-3 , 6]$ (b) $[-3 , 6]$ (c) $\mathbb{R} - [-3 , 6]$ (d) $\mathbb{R} -]-3 , 6[$

23 The solution set of the equation : $|3 - 2x| - 5x = 3$ in $\mathbb{R}$ is ....

(a) $\{0 , 3\}$ (b) $\{0 , -2\}$ (c) $\{0\}$ (d) $\varnothing$

24 If $f(x - 1) = 2^{x-5}$, $f(x + 3) = \frac{1}{32}$, then $x =$ ....

(a) -4 (b) -2 (c) 4 (d) 6

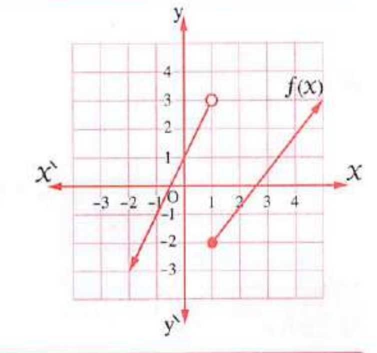
25 **In the opposite figure :**

The curve of the function f

, then $\lim\limits_{x \to 0} f(x) + f(1^+) + f(1^-) =$ ....

(a) 2 (b) 3

(c) 4 (d) 6



26 The perimeter of Δ ABC = 33 cm. and $\sin A + \sin C = \frac{2}{3}$, $\sin B = \frac{1}{4}$

, then b = ... cm.

(a) 6 (b) 9 (c) 12 (d) 15

27 In Δ ABC , $m(\angle C) = 96° \ 23'$, a = 7 cm. , b = 9 cm.

, then the area of Δ ABC $\approx$ .... to the nearest cm^2.

(a) 29 (b) 31 (c) 33 (d) 34

28 **In the opposite figure :**

ABCD is a quadrilateral in which AB = 8 cm.

, BC = 6 cm. , m (∠ B) = 90°

, DC = 5 cm. and m (∠ ACD) = 60°

, then the area of the circumcircle of

the triangle ADC = ... cm^2.

(a) 9 π (b) 16 π (c) 25 π (d) 49 π

Second Essay questions

Answer the following questions :

1 Use the curve of the function f where $f(X) = \frac{1}{X}$ to represent the function $g : g(X) = f(X - 2) + 2$ and from the graph determine the range and discuss its monotony.

2 If $f(X) = 2 + \sqrt{3 - X}$, find the domain and the range of f then find $f^{-1}(X)$ and determine the domain of f^{-1} and its range.

3 If f is a function where $f(X) = \begin{cases} X^2 - X + 4 & \text{at} \quad X < 2 \\ k & \text{at} \quad X = 2 \\ 5X - 4 & \text{at} \quad X > 2 \end{cases}$

[1] Discuss the existence of $\lim\limits_{X \to 2} f(X)$

[2] Find , if possible , the value of k which makes f continuous at $X = 2$

4 **Find the value of each of a and n if :** $\lim\limits_{X \to \infty} \frac{4aX^n - 4X + 5}{3 - 9X + 8X^2} = 3$

Model 2

Interactive test 2



First Multiple choice questions

Choose the correct answer from the given ones :

1 If $f : \mathbb{N} \longrightarrow \mathbb{N}$ where $f(X) = 2X$,

$n : \mathbb{N} \longrightarrow \mathbb{N}$ where $n(X) = \begin{cases} \frac{X}{2} & , \quad X \text{ is even} \\ \frac{X + 1}{2} & , \quad X \text{ is odd} \end{cases}$

, then $(f \circ n)(3) - (f \circ n)(8) = $ ....

(a) 4 (b) 8 (c) −4 (d) −5

2 $\lim_{x \to \infty} \left(\frac{3}{5}\right)^{\frac{1}{x}} = \dots\dots$

(a) 1 (b) -1 (c) $\frac{3}{5}$ (d) ∞

3 If $f : f(x) = \begin{cases} \frac{x^2 - 1}{x - 1} & , \quad x \neq 1 \\ 2a & , \quad x = 1 \end{cases}$ is continuous at $x = 1$, then a = ……

(a) zero (b) -2 (c) 2 (d) 1

4 In Δ ABC , $\frac{a}{\sin A} = 6$ cm. , then the radius length of its circumcircle = …… cm.

(a) 2 (b) 3 (c) 5 (d) 6

5 If f is an odd function and $x f(x) + x^3 f(-x) = 2$, then $f(2) = \dots\dots$

(a) 3 (b) $\frac{1}{3}$ (c) $-\frac{1}{3}$ (d) -3

6 In Δ XYZ , $\frac{x^2 + y^2 - z^2}{2xy} = \dots\dots$

(a) cos X (b) cos Y (c) cos Z (d) sin Z

7 If $f(x) = 3^x$, then the solution set in $\mathbb{R}$ for $f(2x) - 28 f(x) + f(3) =$ zero is ……

(a) $\{1 , 27\}$ (b) $\{27\}$ (c) $\{0 , 3\}$ (d) $\{3\}$

8 If $\log a \in]0 , 1[$, then $a \in \dots\dots$

(a) $]0 , 1[$ (b) $]1 , 2[$ (c) $]1 , 10[$ (d) $]1 , \infty[$

9 The curve of the even function is symmetric about the straight line ……

(a) $y = x$ (b) $\overleftrightarrow{yy'}$ (c) $\overleftrightarrow{xx'}$ (d) $y = -x$

10 In Δ LMN , if $\frac{\sin L}{3} = \frac{2 \sin M}{3} = \frac{\sin N}{4}$, then $\ell : m : n = \dots\dots$

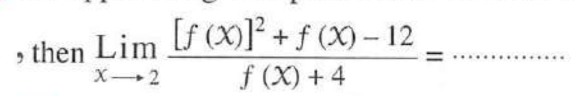
(a) 6 : 8 : 3 (b) 3 : 6 : 8 (c) 8 : 3 : 6 (d) 6 : 3 : 8

11 In Δ ABC , c = 7 cm. , $m(\angle A) = 70^\circ$, $m(\angle B) = 40^\circ$

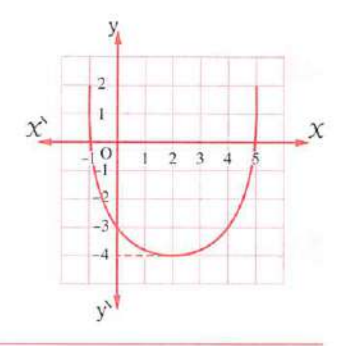
, then $b \simeq \dots\dots$ cm.

(a) 6.3 (b) 8.4 (c) 3.6 (d) 4.8

12 The opposite figure represents the curve of the function f



, then $\lim\limits_{x \to 2} \dfrac{[f(x)]^2 + f(x) - 12}{f(x) + 4} = \ldots\ldots$



(a) -7 (b) -4

(c) -1 (d) 3

---

13 The range of the function $f : f(x) = \dfrac{x-2}{2-x}$ equals ……

(a) $\mathbb{R}$ (b) $\mathbb{R} - \{2\}$ (c) $\mathbb{R} - \{-2\}$ (d) $\{-1\}$

---

14 If $y = a^{\log_a x}$, then ……

(a) $x + y = 0$ (b) $x = 2y$ (c) $x - y = 0$ (d) $x = \frac{1}{2}y$

---

15 $\log_3 5 \times \log_2 3 \times \log_5 16 = \ldots\ldots$

(a) 30 (b) 15 (c) log 10000 (d) $\log_{30} 240$

---

16 The curve of the function $g : g(x) = x^2 + 4$ is the same as the curve of $f : f(x) = x^2$ by translation 4 units in the direction of ……

(a) $\overrightarrow{Ox}$ (b) $\overrightarrow{Ox'}$ (c) $\overrightarrow{Oy}$ (d) $\overrightarrow{Oy'}$

---

17 The function f where $f(x) = a^x$ is decreasing on its domain if ……

(a) $a = 1$ (b) $a > 1$ (c) $0 < a < 1$ (d) $a = -1$

---

18 $\lim\limits_{x \to \frac{\pi}{2}} (2x + \sin x) = \ldots\ldots$

(a) π (b) $\pi - 1$ (c) $1 - \pi$ (d) $\pi + 1$

---

19 $\lim\limits_{x \to \infty} \dfrac{\sqrt{x^2}}{x} = \ldots\ldots$

(a) zero (b) 2 (c) -1 (d) 1

---

20 The solution set in $\mathbb{R}$ of the equation : $|x - 7| = 2x - 2$ equals ……

(a) $\{3, -5\}$ (b) $\{3\}$ (c) $\{-5\}$ (d) $\varnothing$

---

21 If $f(x) = \sqrt[3]{x}$, then its inverse function is $f^{-1}(x) = \ldots\ldots$

(a) $\frac{1}{3}x^3$ (b) x^3 (c) $x^3 - 1$ (d) $x^{-\frac{1}{3}}$

22 If the perimeter of Δ ABC = 33 cm. , $\sin A + \sin C = \frac{2}{3}$, $\sin B = \frac{1}{4}$, then AC = ... cm.

(a) 6 (b) 9 (c) 12 (d) 15

23 $\lim\limits_{x \to 0} \frac{\sin 2x + 5 \tan 3x}{x} =$ ....

(a) 2 (b) 15 (c) 21 (d) 17

24 The solution set of the inequality $\sqrt{x^2 - 4x + 4} > 0$ in $\mathbb{R}$ is ....

(a) $\mathbb{R} - \{2\}$ (b) $\mathbb{R} - \{-2\}$ (c) $\mathbb{R}$ (d) $\varnothing$

25 The number of possible solutions of Δ ABC where m ($\angle$ A) = 110° , a = 7 cm. , b = 4 cm. , then ....

(a) 1 (b) zero (c) infinite solutions. (d) 2

26 The solution set of the equation : $\log (x + 2) + \log (x - 2) = 1 - \log 2$ in $\mathbb{R}$ is ....

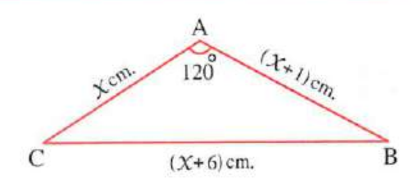
(a) $\{\log_5 125\}$ (b) $\{\log_2 16\}$ (c) $\{\log_3 9\}$ (d) $\{\log_{100} 100\}$

27 In Δ ABC , b = 4 cm. , a + c = 11 cm. , a − c = 1 cm. , then ....

(a) the triangle is an obtuse-angled triangle. (b) the triangle is a right-angled triangle.

(c) m ($\angle$ B) = 2 m ($\angle$ A) (d) m ($\angle$ A) = 2 m ($\angle$ B)

28 **In the opposite figure :**



The value of x = ... cm.

(a) 7 (b) 8

(c) 9 (d) 10

Second Essay questions

Answer the following questions :

1 If $x = 5 + 2\sqrt{6}$, find in the simplest form the value of $\log \left(\frac{1}{x} + x\right)$ without using calculator.

2 Use the curve of the function $f : f(x) = \frac{1}{x}$ to graph the curve of the function $g : g(x) = \frac{1}{x - 2} + 3$ from the graph state the domain and range of g and the monotony and its type whether it is even , odd or otherwise. Is the function g one-to-one or not ?

3 Discuss the existence of the limit of the function $f : f(x) = \begin{cases} x^2+1 & , x<3 \\ 3x+1 & , x \geq 3 \end{cases}$ at $x = 3$

4 **Find the value of a if :** $\lim\limits_{x \to \infty} \frac{\sqrt[3]{a x^3+3}}{\sqrt{4x^2+7}} = -1$

Model 3

Interactive test 3



First Multiple choice questions

Choose the correct answer from the given ones :

1 If $\log 3 = x$, $\log 5 = y$, then $\log 15 =$ ....

(a) $x y$ (b) $\frac{x}{y}$ (c) $x + y$ (d) $x - y$

2 $\lim\limits_{x \to \infty} \frac{5 + x^{-2}}{1 + 3x^{-2}} =$ ....

(a) $\frac{1}{3}$ (b) $\frac{5}{4}$ (c) $\frac{5}{3}$ (d) 5

3 If $9^x = 2$, $27^y = 4$, then $\frac{x - y}{x + y} =$ ....

(a) $\frac{1}{7}$ (b) $-\frac{1}{7}$ (c) $\frac{3}{4}$ (d) $\frac{-4}{3}$

4 If $f(x) = \log_a (2x + 4)$, $f^{-1}(5) = 14$, then a = ...

(a) 1 (b) 2 (c) 3 (d) 4

5 $\lim\limits_{x \to 16} \frac{\sqrt{x} - 1}{x - 16} =$ ....

(a) zero (b) $\frac{1}{2}$ (c) 1 (d) does not exist.

6 $\lim\limits_{x \to 0} \frac{x(\cos x + \cos 3x + \cos 5x)}{\sin x} =$ ....

(a) 1 (b) 3 (c) 9 (d) 15

7 $\log 25 + \frac{\log 8 \times \log 16}{\log 64} =$ ....

(a) 2 (b) log 2 (c) 3 (d) 1

8 $\lim\limits_{x \to 0} \frac{1 - \sec x}{\cos x - 1} =$ ....

(a) 2 (b) 1 (c) zero (d) − 1

9 The included area between the curves of the two functions $f : f(X) = |X + 3| - 2$, $g : g(X) =$ zero is .... square units.

(a) 2 (b) 3 (c) 4 (d) 5

10 If $\log_3 y = X$, then the exponential form is ....

(a) $y = X^3$ (b) $X = y^3$ (c) $X = 3^y$ (d) $y = 3^X$

11 If f is an odd function on $[-X , X]$, then $f(-X) + f(X) =$ ....

(a) $2X$ (b) undefined. (c) $-2X$ (d) zero

12 In ΔABC , if $2 \sin A = 3 \sin B = 4 \sin C$, then $a : b : c =$ ....

(a) 2 : 3 : 4 (b) 4 : 3 : 2 (c) 3 : 4 : 6 (d) 6 : 4 : 3

13 $\lim\limits_{X \to 2} \frac{X^5 - 32}{X^2 + 3X - 10} =$ ....

(a) 80 (b) $\frac{80}{7}$ (c) $\frac{16}{7}$ (d) 16

14 The radius length of the circumcircle of the triangle ABC in which $m(\angle A) = 30°$, $a = 10$ cm. equals .... cm.

(a) 10 (b) 20 (c) 5 (d) 40

15 The function $f : f(X) = \begin{cases} X^2 & , \quad X > 2 \\ -X^2 & , \quad X \le 2 \end{cases}$ is decreasing on the interval ....

(a) $]0 , 2[$ (b) $]-\infty , 0[$ (c) $\mathbb{R} - [0 , 2[$ (d) $]0 , \infty[$

16 The domain of the function $f : f(X) = \log_{1-X} X$ is ....

(a) $X > 0$ (b) $X < 1$ (c) $0 < X < 1$ (d) $0 \le X \le 1$

17 If $f : f(X) = \sqrt{X - 2}$, and $g : g(X) = \sqrt{5 - X}$, then the domain of $(f \circ g) =$ ....

(a) $]-\infty , 0]$ (b) $]-\infty , 1]$ (c) $[1 , \infty[$ (d) $[0 , \infty[$

18 The solution set of the equation : $|X + 2| + X = -2$ in $\mathbb{R}$ is ....

(a) $\varnothing$ (b) $\mathbb{R}$ (c) $]-\infty , -2[$ (d) $]-\infty , -2]$

19 The measure of the greatest angle in the triangle whose side lengths are 3 cm. , 5 cm. , 7 cm. equals ....

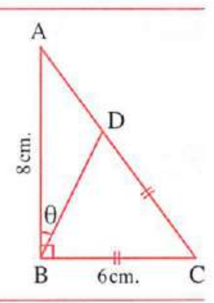
(a) 150° (b) 120° (c) 60° (d) 30°

20 An acute-angled triangle ABC in which a = 5 cm. , b = 7 cm. , m (∠ A) = 40°

, then the area of Δ ABC ≃ .... cm^2.

(a) 16 (b) 17 (c) 18 (d) 7

21 In the opposite figure :

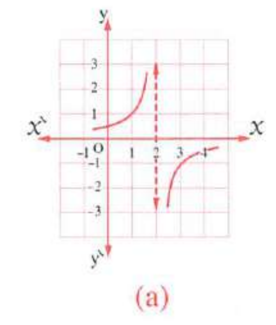


If CD = CB = 6 cm. , then tan θ = ...

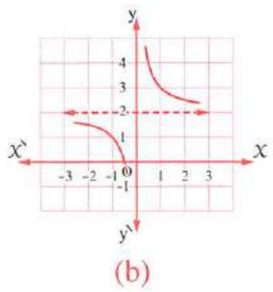
(a) $\frac{3}{4}$ (b) $\frac{4}{3}$

(c) $\frac{1}{2}$ (d) 2

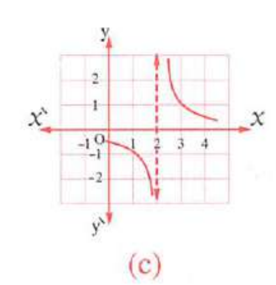
22 If $f : f(x) = \frac{1}{x-2}$, then the graph that represents the function f is ....



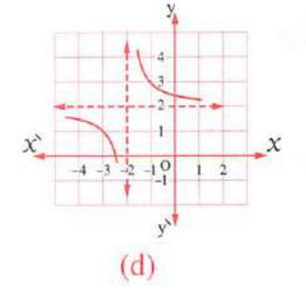
(a)



(b)



(c)



(d)

23 $\lim\limits_{x \to \infty} \frac{\sqrt{9x^2+4}+5x}{4x+3} =$ ....

(a) ∞ (b) 5 (c) 3 (d) 2

24 The solution set of the inequality :

$|2x-6|+|3-x|>12$ is ....

(a) $]-1 , 7[$ (b) $\mathbb{R}-[-3 , 9]$ (c) $\mathbb{R}-[-1 , 7]$ (d) $]-3 , 9[$

25 If 2 log y + 4 log x − 3 log x y = 2 (1 − log 2) and x = k y , then k = ...

(a) 4 (b) 5 (c) 16 (d) 25

26 In the opposite figure :

$\overline{AD}$ // $\overline{BC}$, m (∠ ACB) = 30° , BC = 20 cm.

, m (∠ ADC) = 100° , AD = 12 cm.

, then the area of Δ ABC ≃ .... cm^2.

(a) 60 (b) 77 (c) 104 (d) 120

27 If the radius length of circumcircle of Δ ABC equals 3 cm.

and $\sin A + \sin B + \sin C = 2$, then the perimeter of triangle ABC = ... cm.

(a) 6 (b) 9 (c) 12 (d) 24

28 The number of possible solutions of Δ XYZ in which $x = 5$ cm. , $y = 6$ cm.

, $m(\angle X) = 70°$ equals ....

(a) zero. (b) 2 (c) 1 (d) 3

Second Essay questions

Answer the following questions :

1 If $f(x) = 7^{x+1}$

, find the value of x that satisfies : $f(2x - 1) + f(x - 2) = 50$

2 Graph the function $f : f(x) = \begin{cases} |x| & , \quad x \leq 0 \\ x^2 & , \quad x > 0 \end{cases}$, from the graph state the range of the function and discuss its montony.

3 If $f : f(x) = \begin{cases} \dfrac{(x+3)^5 - 243}{x} & , \quad x \neq 0 \\ k & , \quad x = 0 \end{cases}$

is continuous at x = zero , find the value of k.

4 If $f(x) = \dfrac{x^2 + 2\sqrt{x^2}}{x}$ **, discuss the existence of :** $\lim\limits_{x \to 0} f(x)$

Model 4

Interactive test 4



First Multiple choice questions

Choose the correct answer from the given ones :

1 $\lim\limits_{x \to 0} 5x \csc 2x =$ ....

(a) $\frac{5}{2}$ (b) 10 (c) $\frac{2}{5}$ (d) zero

2 In Δ ABC , $\dfrac{b^2 + c^2 - a^2}{2bc} =$ ....

(a) cos A (b) cos B (c) cos C (d) sin A

3 The solution set in $\mathbb{R}$ of the inequality : $| x - 1 | \geq 3$ equals ....

(a) $[-2 , 4]$ (b) $]-2 , 4[$ (c) $\mathbb{R} -]-2 , 4[$ (d) $\mathbb{R} - [-2 , 4]$

4 $\lim\limits_{x \to -1} \frac{x^2 + x}{x^3 + 1} =$ ....

(a) zero (b) $-\frac{1}{3}$ (c) -1 (d) does not exist.

5 The radius length of the circumcircle of Δ XYZ in which $x = (20 \sin X)$ cm. equals .... cm.

(a) 5 (b) 10 (c) 20 (d) 40

6 If $2^x = 3^y = 6$, which of the following is true ?

(a) $y - x = x y$ (b) $x - y = x y$ (c) $x y = \frac{x}{y}$ (d) $x + y = x y$

7 The solution set of the equation : $\log 5 x = -1$ in $\mathbb{R}$ is ....

(a) $\left\{\frac{1}{10}\right\}$ (b) $\left\{\frac{1}{50}\right\}$ (c) $\{1\}$ (d) $\{50\}$

8 $\lim\limits_{h \to 0} \frac{(2 - 3h)^7 - 128}{4h} =$ ....

(a) -336 (b) 336 (c) 192 (d) -192

9 If the curve of the function $f : f(x) = \log_4 (1 - a x)$ passes through the point $\left(\frac{1}{8} , \frac{-1}{2}\right)$, then a = ...

(a) 3 (b) 2 (c) 4 (d) 8

10 $| f(x) | =$ ....

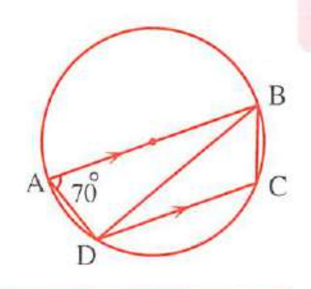
(a) $\begin{cases} f(x) & , \quad x \geq 0 \\ -f(x) & , \quad x < 0 \end{cases}$ (b) $\begin{cases} f(x) & , \quad x < 0 \\ -f(x) & , \quad x \geq 0 \end{cases}$

(c) $\begin{cases} f(x) & , \quad f(x) \geq 0 \\ -f(x) & , \quad f(x) < 0 \end{cases}$ (d) $\begin{cases} f(x) & , \quad f(x) < 0 \\ -f(x) & , \quad f(x) \geq 0 \end{cases}$

11 All the following relations represent function y in terms of x except ....

(a) $y = 3x + 1$ (b) $y = x^2 - 4$ (c) $x = y^2 - 2$ (d) $y = \sin x$

12 **In the opposite figure :**



If BC = 10 cm. , then the perimeter of Δ BDC $\simeq$ .... cm.

(a) 60 (b) 62

(c) 64 (d) 67

---

13 If $f(X) = 2^X$, then the value of X which satisfies : $f(X+1) - f(X-1) = 24$ equals ....

(a) 16 (b) 4 (c) 8 (d) 2

---

14 If $3^{X-2} = 2^{X-2}$, then X = ...

(a) 3 (b) -2 (c) zero (d) 2

---

15 The domain of the function $f : f(X) = \frac{1}{|X| - 3}$ is ....

(a) $\{3 , -3\}$ (b) $[-3 , 3]$ (c) $\mathbb{R} - [-3 , 3]$ (d) $\mathbb{R} - \{-3 , 3\}$

---

16 The vertex of the curve of the function $f : f(X) = (2 - X)^2 + 3$ is ....

(a) (2 , 3) (b) (2 , -3) (c) (-2 , 3) (d) (-2 , -3)

---

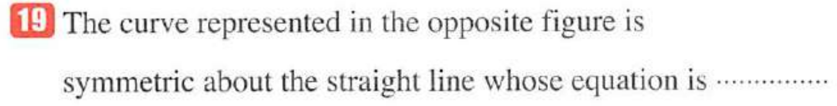
17 In Δ ABC , m ($\angle$ A) : m ($\angle$ B) : m ($\angle$ C) = 3 : 4 : 3 If a = 5 cm. , then the circumference of the circle passing through the vertices of Δ ABC $\simeq$ .... cm.

(a) 17 (b) 18 (c) 19 (d) 15

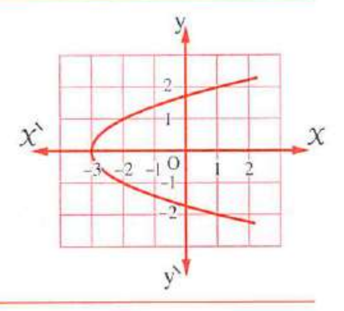
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18 $\lim\limits_{X \to 0} \frac{3^{2X} - 1}{3^{X+2} - 9}$ = ...

(a) $\frac{1}{9}$ (b) $\frac{2}{9}$ (c) $\frac{9}{2}$ (d) $\frac{1}{6}$



19 The curve represented in the opposite figure is symmetric about the straight line whose equation is ....



(a) $X = 0$ (b) $y = 0$

(c) $y = -2$ (d) $X = 2$

---

20 If $\angle$ A supplements $\angle$ C , then cos A + cos C = ...

(a) 1 (b) zero (c) $\frac{1}{2}$ (d) -1

21 If the function $f : f(X) = \begin{cases} \sin 9X \cot X & , X \in \left]\frac{-\pi}{2}, \frac{\pi}{2}\right[- \{0\} \\ k^2 & , X = 0 \end{cases}$

is continuous at $X = 0$, then $k =$ ....

(a) 3 (b) ± 3 (c) 9 (d) $\pm \frac{1}{3}$

---

22 $\log(\cos\theta) + \log(\sec\theta) =$ .... where $\theta \in \left[0, \frac{\pi}{2}\right[$

(a) 1 (b) zero (c) 2 (d) -1

---

23 If $f(X) = |X - 2| + 4$, then the solution set of the equation $f(X + 2) = 6$ is ....

(a) $\{0, 4\}$ (b) $\{2, -2\}$ (c) $\{2, 4\}$ (d) $\{-2, -4\}$

---

24 $\lim\limits_{X \to 0} \frac{2X\cos 8X + 2\sin 5X}{\tan 2X} =$ ....

(a) 13 (b) 10 (c) 9 (d) 6

---

25 If the function $f : f(X)$ is one - to - one function , $f(2k + 3) = f(k - 1)$, then $k =$ ....

(a) -1 (b) -2 (c) -3 (d) -4

---

26 ABC is a triangle in which : BC = 14 cm. , m (∠ B) = 60° , the area of the triangle equals $42\sqrt{3}$ cm^2. , then AB = ... cm.

(a) 14 (b) 12 (c) 7 (d) 6

---

27 If the following conditions valid no triangle XYZ where $X = 17$ cm. , m (∠ Y) = 92° , then y could be .... cm.

(a) 20 (b) 25 (c) 18 (d) 16

---

28 ABC is a triangle in which $a = \sqrt{2}$ cm. , $b = \sqrt{3}$ cm. , $c = 2$ cm.

, then $\frac{\cos A \cos B}{\cos(A + B)} =$ ....

(a) $\frac{8}{15}$ (b) $\frac{-15}{8}$ (c) $\frac{-17}{15}$ (d) $\frac{8}{17}$

Second Essay questions

Answer the following questions :

1 If each of f , g is an inverse function of the other where $f(X) = 2X + a$, $g(X) = bX + 3$, what is the value of each of a , b ?

2 If the function $f : f(x) = \begin{cases} a\,x - 3 & \text{at} \quad x < -1 \\ 3\,x - 2 & \text{at} \quad x > -1 \end{cases}$ has a limit at $x = -1$, find the value of a

3 Graph the function $f : f(x) = \begin{cases} -x^3 & , \quad x < 0 \\ x & , \quad x \geq 0 \end{cases}$, from the graph find the range and its type whether it is odd , even or otherwise and discuss its monotony.

4 **Find the value of k if :** $\lim\limits_{x \to -1} \dfrac{x^{15} + 1}{x + 1} = \lim\limits_{x \to k} \dfrac{x^5 - k^5}{x^3 - k^3}$

Model 5

Interactive test 5



First Multiple choice questions

Choose the correct answer from the given ones :

1 $\lim\limits_{x \to 1} \dfrac{x^{6\frac{1}{2}} - x^{\frac{1}{2}}}{x^{3\frac{1}{2}} - x^{\frac{1}{2}}} = \dots\dots\dots$

(a) $\frac{13}{7}$ (b) 1 (c) 2 (d) x

2 If $5^{x+1} = 7^{x+1}$, then $3^{x+1} = \dots\dots\dots$

(a) zero (b) 3 (c) 2 (d) 1

3 If $x < 1$, then $|3 - x| - |x - 4| = \dots\dots\dots$

(a) -1 (b) 1 (c) $2\,x - 7$ (d) $7 - 2\,x$

4 The solution set in $\mathbb{R}$ of the equation : $|2\,x - 4| = |x + 1|$ equals $\dots\dots\dots$

(a) $\{0 , 5\}$ (b) $\{1 , 5\}$ (c) $\{2 , 5\}$ (d) $\{5\}$

5 The domain of the function $f : f(x) = \dfrac{\sqrt{x - 2}}{x - 3}$ is $\dots\dots\dots$

(a) $\mathbb{R}$ (b) $\{3\}$ (c) $[2 , \infty[$ (d) $[2 , \infty[- \{3\}$

6 If the function $f : f(x) = \begin{cases} \dfrac{x^2 - 9}{x - 3} & , \quad x \neq 3 \\ 2\,a & , \quad x = 3 \end{cases}$ is continuous at $x = 3$

, then a = $\dots\dots\dots$

(a) 2 (b) $\frac{3}{2}$ (c) -3 (d) 3

7 In Δ ABC , if m ($\angle$ A) = 30° , b = $15\sqrt{3}$ cm. , m ($\angle$ B) = 60° , then a = ... cm.

(a) 30 (b) 45 (c) 15 (d) 60

8 $\lim\limits_{x \to \infty} (3 + 5x^2 + 3x) =$ ....

(a) does not exist. (b) 5 (c) ∞ (d) 11

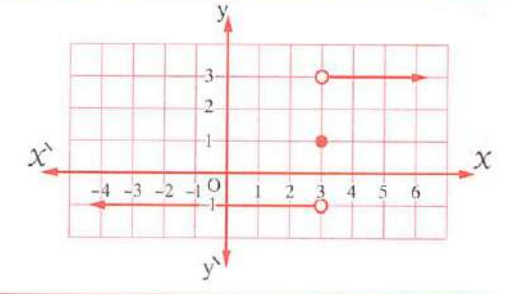
9 If $f(x) = 4x - 5$, $g(x) = 3^x$, then $(f \circ g)(2) =$ ....

(a) 3 (b) 9 (c) 27 (d) 31

10 If $f(a) = 2^a$, then $\log_2 f(a) =$ ....

(a) 2 (b) $f(a)$ (c) a (d) $\frac{1}{2a}$

11 **From the opposite figure :**



$f(3^+) + f(3) =$ ....

(a) 2 (b) 0

(c) 4 (d) 6

12 $\lim\limits_{x \to 0} \left(\frac{\sin 2x}{x} - \cos 5x\right) =$ ....

(a) zero (b) 1 (c) 2 (d) 3

13 From the following functions , the even function is $f : f(x) =$ ....

(a) $\sin x$ (b) $\sin 30°$ (c) $x \cos x$ (d) $x^2 + \tan x$

14 In Δ XYZ , $2xz \times$ .... $= x^2 + z^2 - y^2$

(a) cos X (b) cos Z (c) cos Y (d) sin Y

15 If $\lim\limits_{x \to -1} \frac{x^2 + kx + m}{x^2 - 1} = 3$, then k + m = ...

(a) -4 (b) -5 (c) -8 (d) -9

16 The range of the function $f : f(x) = \frac{x^2 - 1}{x - 1}$ is ....

(a) $\mathbb{R}$ (b) $\mathbb{R} - \{0\}$ (c) $\mathbb{R} - \{1\}$ (d) $\mathbb{R} - \{2\}$

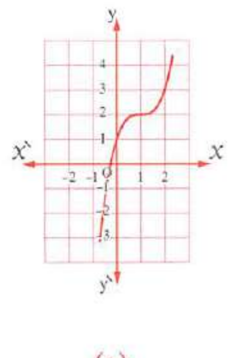
17 If $\frac{a+b}{13} = \frac{b+c}{11} = \frac{c+a}{12}$, then cos A = ...

(a) $\frac{1}{5}$ (b) $\frac{5}{7}$ (c) $\frac{19}{35}$ (d) $\frac{4}{11}$

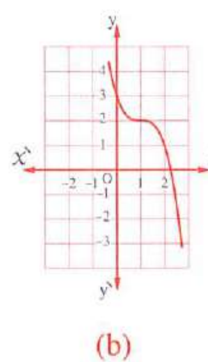
18 The number of possible solutions for the triangle ABC where : m (∠ A) = 47° , a = 4 cm.
, b = 6 cm. equals ....

(a) 1 (b) 0 (c) 2 (d) infinite solutions.

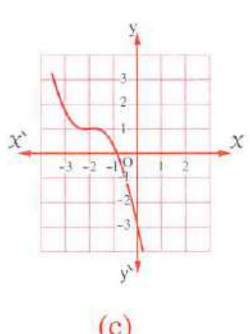
19 If $f : f(X) = 2 - (X - 1)^3$, then the graph that represents the function f is ....



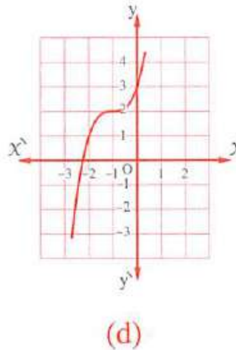
(a)



(b)



(c)



(d)

20 Solution set of the equation : $\log_X (X + 6) = 2$ in ℝ is ....

(a) $\{3, -2\}$ (b) $\{3\}$ (c) $\{3, 1\}$ (d) $\{6, 1\}$

21 The inverse function of the function $f : f(X) = 8X^3 - 1$ is $f^{-1}(X) =$ ....

(a) $\sqrt[3]{X^3 - \frac{1}{8}}$ (b) $\frac{\sqrt[3]{X+1}}{2}$ (c) $8\sqrt[3]{X-1}$ (d) $\frac{\sqrt[3]{X-1}}{2}$

22 In Δ LMN , m (∠ L) = 30° , MN = 7 cm. , then the diameter length of the circle passing through its vertices equals .... cm.

(a) 7 (b) 3.5 (c) 14 (d) $\frac{14}{\sqrt{3}}$

23 The solution set of the equation : $2^{X^2} = 16$ in ℝ is ....

(a) $\{2\}$ (b) $\{-2\}$ (c) $\{2, -2\}$ (d) $\{4, -4\}$

24 The function $f : f(X) = 5 - X^2 - 4X$ is increasing when $X \in$ ....

(a) $]2, \infty[$ (b) $]-2, \infty[$ (c) $]-\infty, 2[$ (d) $]-\infty, -2[$

25 In Δ ABC : 3 sin A = 4 sin B = 2 sin C
, then cosine the smallest angle in Δ ABC = ...

(a) $\frac{11}{24}$ (b) $\frac{43}{48}$ (c) $\frac{29}{36}$ (d) $\frac{11}{36}$

26 The solution set of the inequality : $\sqrt{x^2 - 6x + 9} + 2 \leq 9$ is ....

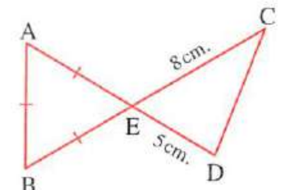
(a) $\mathbb{R} -]-4 , 10[$ (b) $\mathbb{R} -]-8 , 10[$ (c) $[-4 , 10]$ (d) $[-8 , 10]$

27 In Δ ABC , $\cos(B + C) = \frac{3}{5}$, BC = 8 cm. , then the radius length of the circumcircle of Δ ABC = ... cm.

(a) 4 (b) 5 (c) 8 (d) 10

28 **In the opposite figure :**

CD = ... cm.



(a) 6 (b) 7

(c) 8 (d) 9

Second Essay questions

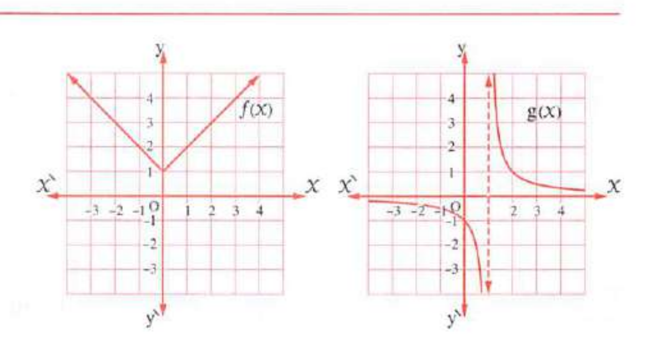
Answer the following questions :

1 **Find the solution set of the equation :**

$3^{2x-1} - 4 \times 3^{x} + 9 = 0$, where x is a real number. Showing steps

2 **In the opposite figure :**

Find $(f \circ g)$ and represent it graphically , state the domain and if it is even , odd or otherwise and discuss its symmetry and whether it is one-to-one or not.



3 **Discuss the continuity of the function at $x = 0$:**

$$f : f(x) = \begin{cases} \dfrac{x + \sin x}{3x - \sin 2x} & , \quad x < 0 \\ 3x - 1 & , \quad x \geq 0 \end{cases}$$

4 **Find the value of a if :** $\lim\limits_{x \to a} \dfrac{x^{12} - a^{12}}{x^{10} - a^{10}} = 30$

Model 6

Interactive test 6



First Multiple choice questions

Choose the correct answer from the given ones :

1 If $\lim\limits_{x \to 4} \frac{x^2+7x+b}{x^2-6x+8} = \frac{15}{2}$, then b = ...

(a) – 44 (b) 7 (c) – 8 (d) 8

2 If $\log_b x + \log_b 3 = \log_b 27 - 1$, which of the following represents x in terms of b ?

(a) $x = 9$ b (b) $x = \frac{1}{9}$ b (c) $x = \frac{9}{b}$ (d) $x = \frac{1}{9\,b}$

3 If $\log_a (x+2) - \log_a (x-1) = \log_a 4$, then x = ...

(a) – 2 (b) 2 (c) 1 (d) – 1

4 $\lim\limits_{x \to 0} \frac{x^2-1}{x}$ = ...

(a) zero (b) 1 (c) does not exist. (d) – 1

5 If $x^{\frac{3}{2}} = 64$, then x = ...

(a) 512 (b) 16 (c) 4 (d) 2

6 The area of the circle passing through the vertices of the equilateral triangle ABC whose side length is 9 cm. equals .... cm^2.

(a) 9π (b) $9\sqrt{3}\,\pi$ (c) 27π (d) 81π

7 If $f(x) = 3x - 1$, $h(x) = x^2$, then $(h \circ f)(-2)$ = ...

(a) – 7 (b) 11 (c) – 49 (d) 49

8 $\lim\limits_{h \to 0} \frac{(x+h)^7 - x^7}{h}$ = ...

(a) x^7 (b) $7x^6$ (c) zero (d) 1

9 In Δ ABC , $a^2 + b^2 - c^2$ = ...

(a) cos A (b) a b cos C (c) cos C (d) 2 a b cos C

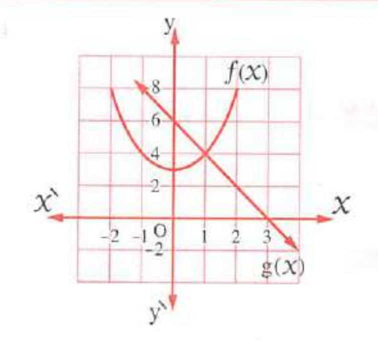
10 The curve $g(X) = |X + 3|$ is the same as the curve $f(X) = |X|$ by translation 3 units in the direction of ....

(a) $\overrightarrow{OX}$ (b) $\overrightarrow{OX'}$ (c) $\overrightarrow{Oy}$ (d) $\overrightarrow{Oy'}$

11 The solution set of the inequality : $|3 - 2X| \leq 1$ in $\mathbb{R}$ is ....

(a) $[1, 2]$ (b) $]1, 2[$ (c) $\mathbb{R} -]1, 2[$ (d) $\mathbb{R} - [1, 2]$

12 The opposite figure represents the two curves $f(X)$, $g(X)$, then $(g \circ f)(1) =$ ....



(a) -8 (b) -2

(c) 4 (d) 5

13 The point of symmetry of the function $f : f(X) = \frac{2X - 1}{X}$ is ....

(a) $(1, 1)$ (b) $(2, 1)$ (c) $(1, 2)$ (d) $(0, 2)$

14 $\lim\limits_{X \to 0} \frac{\sin 2X^2 + \tan^2 2X}{3X^2} =$ ....

(a) $\frac{8}{3}$ (b) $\frac{4}{3}$ (c) 2 (d) 3

15 If $\log(2X + y) = \frac{1}{2}(\log X + \log y) + \log 3$ where $X \neq y$ and $y = kX$, then $k =$ ....

(a) 2 (b) 4 (c) $\frac{1}{4}$ (d) -4

16 The even continuous function at the point (a, b) is also continuous at the point ....

(a) $(0, 0)$ (b) $(-a, b)$ (c) $(a, -b)$ (d) $(-a, -b)$

17 The range of the function $f : f(X) = \begin{cases} 0 & , X \leq 0 \\ 1 & , X > 0 \end{cases}$ is ....

(a) $\{1\}$ (b) $\{0\}$ (c) $\mathbb{R}$ (d) $\{0, 1\}$

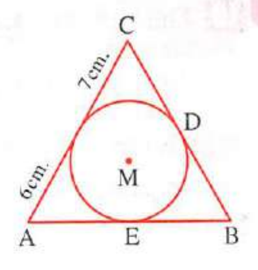
18 The radius length of the circumcircle of the triangle XYZ in which :

$X = 3$ cm. , $y = 5$ cm. , $z = 7$ cm. equals .... cm.

(a) $\frac{7}{3}\sqrt{3}$ (b) $2\sqrt{3}$ (c) 4.4 (d) $\frac{14}{3}\sqrt{3}$

19 **In the opposite figure :**

If the perimeter of Δ ABC = 42 cm. and the circle M is the inscribed circle in it , then m ($\angle$ A) $\simeq$ ....



(a) $53^\circ\ 7'$ (b) $67^\circ\ 23'$

(c) $36^\circ\ 53'$ (d) $22^\circ\ 37'$

---

20 If $5^{x-3} = 4^{3-x}$, then x = ...

(a) $\frac{5}{4}$ (b) 3 (c) $\frac{4}{5}$ (d) zero

---

21 The numerical value of the expression $\frac{\log 64}{\log 8}$ equals ....

(a) 2 (b) 8 (c) 80 (d) 72

---

22 Δ DEF in which m ($\angle$ D) = 80° , m ($\angle$ E) = 60° , if f = 12 cm. , then d = ... cm.

(a) $\frac{12 \sin 80^\circ}{\sin 40^\circ}$ (b) $\frac{12 \sin 80^\circ}{\sin 60^\circ}$ (c) $\frac{12 \sin 40^\circ}{\sin 80^\circ}$ (d) $\frac{12 \cos 80^\circ}{\cos 40^\circ}$

---

23 $\lim\limits_{x \to \infty} \frac{(2x+1)^{40}(4x-1)^5}{(2x+3)^{45}}$ = ...

(a) 16 (b) 32 (c) 64 (d) 8

---

24 The point of intersection of the curve : $f(x) = 4 - \frac{2}{x-1}$ with the y-axis is ....

(a) (0 , 2) (b) (1 , 4) (c) (0 , 6) (d) (0 , – 2)

---

25 The solution set of the equation : $3^{x+1} + 3^{3-x} = 30$ in $\mathbb{R}$ is ....

(a) $\{1 , 9\}$ (b) $\{\log_3 27 , \log 1\}$

(c) $\{\log_5 25 , \log 1\}$ (d) $\{\log_2 25 , \log_2 5\}$

---

26 In Δ ABC , m ($\angle$ B) = 3 m ($\angle$ C) = 84° , AC = 16 cm.

, then the perimeter of Δ ABC $\simeq$ .... cm. (to nearest one decimal)

(a) 81.5 (b) 62.2 (c) 41.3 (d) 38.5

---

27 If Δ ABC , a = 15 cm. , m ($\angle$ B) = 30° , has a unique solution

, then b could be .... cm.

(a) 8 (b) 7 (c) 7.5 (d) 8.5

---

28 If ABC is a triangle , then c (a cos B + b cos A) = ...

(a) $2c^2$ (b) c^2 (c) a^2 (d) b^2

Second | Essay questions

Answer the following questions :

1 **Determine which of the functions defined by the following rules is even , odd or neither even nor odd :**

[1] $f_1(X) = X \cos X$ [2] $f_2(X) = \begin{cases} X^2 & , X \geq 0 \\ |X| & , X < 0 \end{cases}$

2 If $f : \mathbb{R}^+ \longrightarrow \mathbb{R}$ where $f(X) = \frac{1}{X^2 + 1}$

Find : $f^{-1}(X)$ and state the domain of f^{-1} and its range.

3 If the function $f : f(X) = \begin{cases} \frac{X^2 + 2X - 3}{X + 3} & , X \neq -3 \\ -3 + a & , X = -3 \end{cases}$ is continuous at $X = -3$, then find a

4 If $f(X) = \frac{1}{X^4}$ **, then find :** $\lim\limits_{X \to 2} \frac{f(X) - f(2)}{X - 2}$

Model 7

Interactive test 7



First | Multiple choice questions

Choose the correct answer from the given ones :

1 If $f(X) = (10)^{2X}$, $g(X) = \log\left(\sqrt{X}\right)$, then $(g \circ f)(X) = \cdots\cdots$

(a) 10^{2X} (b) $\log\sqrt{X}$ (c) $10^{2X} \log\sqrt{X}$ (d) X

2 In Δ ABC , $\frac{a}{a + b} = \frac{\sin A}{\cdots\cdots}$

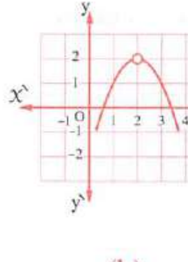
(a) sin B (b) sin C (c) sin A + sin B (d) sin A + sin C

3 In Δ ABC , if sin A = 2 sin C , BC = 6 cm. , then AB = ... cm.

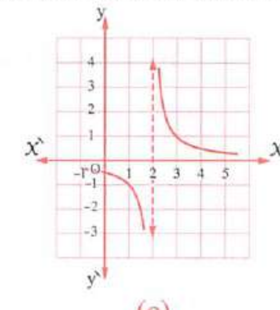
(a) 2 (b) 3 (c) 4 (d) 6

4 Which of the following figures does represent a continuous function at $X = 2$?

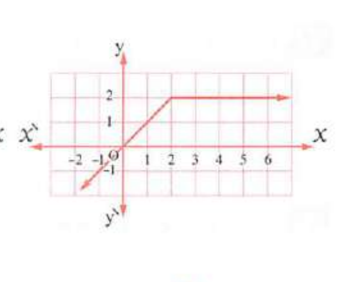
(a)



(b)



(c)



(d)

5 The domain of the function $f : f(X) = \sqrt{X+2} - \sqrt{5-X}$ is ....

(a) $[-2, \infty[$ (b) $[-2, 5[$ (c) $[-2, 5]$ (d) $[3, \infty[$

6 In Δ ABC , $b^2 + c^2 - a^2 = 2\,b\,c \times$ ....

(a) $\sin(90° - B)$ (b) $\sin(90° - A)$ (c) $\cos B$ (d) $\cos(90° - B)$

7 The number of possible solutions of the triangle XYZ in which :

$m(\angle X) = 30°$, $X = 6$ cm. , $y = 9$ cm. equals ....

(a) 1 (b) 2 (c) zero (d) infinite solutions.

8 $\lim_{X \to 1} \frac{4 - \sqrt{X+15}}{1 - X^2} =$ ....

(a) $\frac{1}{16}$ (b) 16 (c) $\frac{1}{4}$ (d) 4

9 If the radius length of the circle passing through the vertices of Δ ABC equals 6 cm.

, then $\frac{2\,a}{\sin A} =$ .... cm.

(a) 12 (b) 6 (c) 18 (d) 24

10 The solution set of the equation : $(\log_5 y)^2 - 7\log_5 y + 12 = 0$ in $\mathbb{R}$ is ....

(a) $\{25, 125\}$ (b) $\{25, 625\}$ (c) $\left\{\frac{1}{25}, 625\right\}$ (d) $\{125, 625\}$

11 $\log_2 \frac{3}{25} + 5\log_2 5 + \log_2 27 - \log_2 \frac{125}{12} - \log_2 243 =$ ....

(a) 4 (b) $\log_3 9$ (c) $\log 25$ (d) $\log \frac{1}{100}$

12 If $\lim_{X \to 1} \frac{X^2 - k^2}{X + 2} = -1$, then k = ...

(a) 2 (b) -2 (c) 4 (d) ± 2

13 If $f : f(X) = X^3 + 1$, which of the following statements is not true ?

(a) f is one-to-one (b) f is an odd function.

(c) f is increasing in its domain.

(d) The curve of the function f intersects the X-axis at $X = -1$

14 If $\log_2 X = 3$, then $\log_X 2 =$ ....

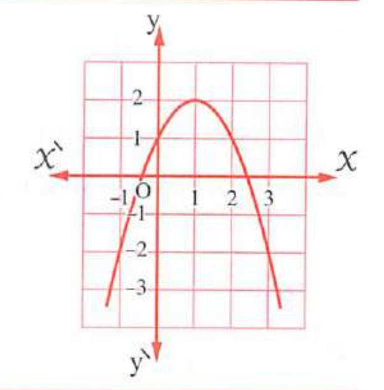
(a) 2 (b) $\frac{1}{3}$ (c) 8 (d) 9

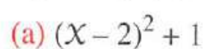
15 If f^{-1} is the inverse function of the function f , then ....

(a) the domain of f^{-1} = the domain of f
(b) the domain of f^{-1} = the range of f
(c) the range of f^{-1} = the range of f
(d) the range of f^{-1} = the domain of f^{-1}

---

16 The rule of the function represented in the opposite figure is $f(X) =$ ....




(a) $(X-2)^2+1$
(b) $-(X-2)^2+1$
(c) $-(X-1)^2+2$
(d) $(-X+1)^2+2$

---

17 The solution set of the equation : $|2X-1|=5$ in $\mathbb{R}$ is ....

(a) $\{3\}$ (b) $\{-2\}$ (c) $\varnothing$ (d) $\{3 , -2\}$

---

18 If the function $f : f(X) = \begin{cases} X-4 & , X \geq 4 \\ g(X) & , X < 4 \end{cases}$ is symmetric about the straight line $X = 4$, then the function g is ....

(a) an increasing function.
(b) a decreasing function.
(c) an even function.
(d) a constant function.

---

19 $\lim\limits_{X \to 0} \frac{3X+2X^{-1}}{X+4X^{-1}} =$ ....

(a) $\frac{1}{4}$ (b) $\frac{1}{2}$ (c) 2 (d) 4

---

20 If $a \in]0 , 9]$, then $\log_3 a \in$ ....

(a) $]-\infty , 2]$ (b) $]2 , 81]$ (c) $[2 , \infty[$ (d) $]-\infty , 0]$

---

21 $\lim\limits_{X \to \infty} \left(\frac{1}{X-2}+1\right) =$ ....

(a) 2 (b) 1 (c) zero (d) ∞

---

22 The solution set in $\mathbb{R}$ of the equation : $\sqrt{X^2-6X+9}+2X=9$ equals ....

(a) $\{4 , 6\}$ (b) $\{6\}$ (c) $\{4\}$ (d) $\varnothing$

---

23 The solution set in $\mathbb{R}$ of the inequality $|X-3| \leq 2$ is ....

(a) $]1 , 5[$ (b) $[1 , 5]$ (c) $\mathbb{R}-]1 , 5[$ (d) $\mathbb{R}-[1 , 5]$

24 If the function $f : f(x) = \begin{cases} \frac{x^2-4}{x-2} & , x \neq 2 \\ K & , x = 2 \end{cases}$ is continuous at $x = 2$, then K = ...

(a) zero (b) 8 (c) 2 (d) 4

25 If $b^{x} - 2\,b^{-x} = 1$ where $b > 1$, then $x =$ ....

(a) 2 (b) log 2 (c) $\log_2 b$ (d) $\log_b 2$

26 If the area of Δ ABC is 24 cm², the radius length of it circumcircle is 5 cm.

, then sin A sin B sin (A + B) = ...

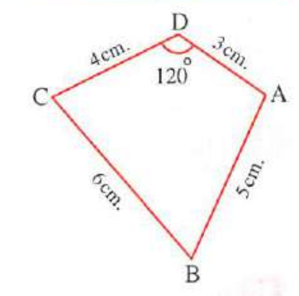
(a) $\frac{3}{25}$ (b) $\frac{6}{25}$ (c) $\frac{9}{25}$ (d) $\frac{12}{25}$

27 In Δ ABC , b = 2 cm. , c = 2.5 cm. , $\cos A = \frac{2}{5}$, then Δ ABC is ....

(a) a right-angled triangle. (b) an isosceles triangle.

(c) an equilateral triangle. (d) a scalene.

28 **In the opposite figure :**



cos B = ...

(a) $\frac{1}{5}$ (b) $\frac{2}{5}$

(c) $\frac{3}{5}$ (d) $\frac{4}{5}$

Second Essay questions

Answer the following questions :

1 **Find in $\mathbb{R}$ the solution set of the equation :**

$x^{\frac{4}{3}} - 10\,x^{\frac{2}{3}} + 9 = 0$

2 Discuss the existence of limit of f where :

$$f(x) = \begin{cases} \frac{\tan 2x}{\sin x} & \text{at} \quad \frac{-\pi}{4} < x < 0 \\ \frac{5x+6}{x+3} & \text{at} \quad x > 0 \end{cases}$$ at x tends to zero

3 If $f(x) = x^2 - 3$, $g(x) = \sqrt{x-2}$, find $(f \circ g)(x)$ in the simplest form and state its domain , then find $(f \circ g)(3)$

4 If $\lim\limits_{x \to 2} \frac{x^n - 64}{x - 2} = \ell$, **find the value of each of :** n and ℓ

Model 8

Interactive test 8



First Multiple choice questions

Choose the correct answer from the given ones :

1 $\log_a X \div \log_{ab} X =$ ....

(a) $1 - \log_a b$ (b) $1 + \log_a b$ (c) $1 - \log_b a$ (d) $1 + \log_b a$

2 If the function $f : f(X) = \begin{cases} 3X^2 + aX - 2 & , \quad X > 3 \\ 2X + b & , \quad X < 3 \end{cases}$ and $\lim\limits_{X \to 3} f(X) = 16$

, then $a + b =$ ....

(a) 4 (b) 10 (c) -13 (d) 7

3 The diameter length of the circle inscribed in an equilateral triangle whose side length is $4\sqrt{3}$ cm. equals .... cm.

(a) $2\sqrt{3}$ (b) $4\sqrt{3}$ (c) 4 (d) 8

4 The value of : $\log_3 54 - \log_3 \frac{8}{15} + \log_3 \frac{4}{5} =$ ....

(a) log 3 (b) 3 (c) 27 (d) 4

5 If $y = f(X)$ is a real function , then its image by translation 2 units right is $g(X) =$ ....

(a) $f(X - 2)$ (b) $f(X + 2)$ (c) $f(X) + 2$ (d) $f(X) - 2$

6 The number of possible solutions of Δ ABC where $m(\angle A) = 60°$, $b = 3$ cm.

, $a = 5$ cm. is ....

(a) 1 (b) 2

(c) no solution. (d) an infinite number of triangles.

7 $\lim\limits_{X \to \text{zero}} \frac{X^2 + X}{X} =$ ....

(a) zero (b) 1 (c) 2 (d) 3

8 In Δ ABC , $\cos(A + B) =$ ....

(a) $\frac{a^2 + b^2 - c^2}{2ab}$ (b) $\frac{a^2 + c^2 - b^2}{2ac}$ (c) $\frac{b^2 + c^2 - a^2}{2bc}$ (d) $\frac{c^2 - a^2 - b^2}{2ab}$

9 If $1 < x < 2$, then $\sqrt{x^2 - 2x + 1} + \sqrt{x^2 - 4x + 4} =$ ....

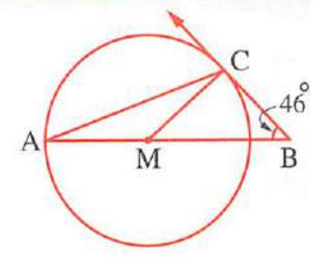
(a) $2x - 3$ (b) $2x - 1$ (c) 1 (d) 3

10 The domain of the function $f : f(x) = \sqrt{\dfrac{x-5}{x+4}} =$ ....

(a) $[5 , \infty[$ (b) $[-4 , 5]$ (c) $\mathbb{R} - [-4 , 5[$ (d) $\mathbb{R} -]-4 , 5]$

11 **In the opposite figure :** If AC = 20 cm.

, then the perimeter of Δ ACM = ... cm.



(a) 41.6 (b) 43.5

(c) 45 (d) 47.5

12 $3^{\log_3 4} + \log_5 25 =$ ....

(a) 6 (b) 4 (c) 2 (d) 1

13 The domain of the function $f : f(x) = \sqrt{9 - x}$ is ....

(a) $\mathbb{R}$ (b) $\mathbb{R} - \{9\}$ (c) $]-\infty , 9]$ (d) $[9 , \infty[$

14 $\lim\limits_{x \to 5} \dfrac{x^2 - 5x}{\sqrt{x+4} - 3} =$ ....

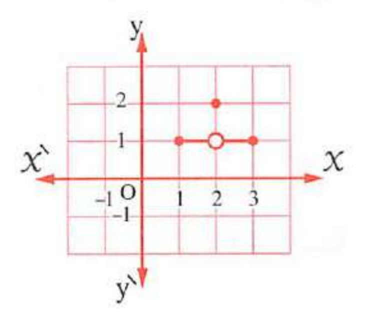
(a) 30 (b) 6 (c) 5 (d) 25

15 The domain of the function $f : f(x) = \log_{1-x} x$ is ....

(a) $x > 0$ (b) $x < 1$ (c) $0 < x < 1$ (d) $0 \le x \le 1$

16 The opposite figure represents the curve of the function f

, which of the following statements is true ?



(a) f is continuous on the interval $[1 , 3]$

(b) f is continuous on the interval $]1 , 3[$

(c) $\lim\limits_{x \to a} f(x)$ exists where $a \in [1 , 3]$

(d) $\lim\limits_{x \to a} f(x)$ exists where $a \in]1 , 3[$

17 $\lim\limits_{x \to \infty} \left(\dfrac{3x^2 + 2x + 1}{x^2 - 3x + 2}\right)^4 =$ ....

(a) 3 (b) 9 (c) 27 (d) 81

18 Which of the following does not equal $\left(\sqrt[5]{x^4}\right)$?

(a) $\left(\sqrt[5]{x}\right)^4$ (b) $\sqrt[4]{x^5}$ (c) $x^{\frac{4}{5}}$ (d) $\left(x^{\frac{1}{5}}\right)^4$

19 If the function f is even in $[c , d]$, then c + d = ...

(a) 2 c (b) 2 d (c) c − d (d) zero

20 If $f(X) = (X-5)(X+5)$, $g(X) = X - 5$, then $\frac{f}{g}(5) =$ ....

(a) 10 (b) 1 (c) $\frac{f}{g}(-5)$ (d) undefined.

21 If $\left(\frac{1}{2}\right)^{a^2 - a - 2} = 1$, where a > zero , then a = ...

(a) 1 (b) − 3 (c) 2 (d) 3

22 Δ ABC in which m (∠ C) = 116° , c = 12 cm. , a = 10 cm.

, then b ≃ .... cm. (to nearest one decimal)

(a) 2.6 (b) 3.6 (c) 4.6 (d) 5.6

23 $\lim\limits_{X \to 0} \frac{1 - \cos X + \tan 5X}{1 - \cos X - \tan X} =$ ....

(a) − 5 (b) 5 (c) zero (d) undefined.

24 In Δ ABC , $\cos B = \frac{c}{2a}$, then Δ ABC is ....

(a) an equilateral triangle. (b) an isosceles triangle.

(c) a scalene triangle. (d) right-angled triangle.

25 The solution set of the inequality $\frac{1}{|2X - 3|} > 2$ in ℝ is ....

(a) $\left[\frac{5}{4} , \frac{7}{4}\right] - \left\{\frac{3}{2}\right\}$ (b) $\left]\frac{5}{4} , \frac{7}{4}\right[$

(c) $\left]\frac{5}{4} , \frac{7}{4}\right[- \left\{\frac{3}{2}\right\}$ (d) $\left[\frac{5}{4} , \frac{7}{4}\right]$

26 The one-to-one function from the following functions defined by the rules ....

(a) $f_1(X) = X + 5$ (b) $f_2(X) = X^2$ (c) $f_3(X) = |X - 2|$ (d) $f_4(X) = -3$

27 If ABC is a triangle in which : 6 a = 4 b = 3 c , then the measure of the smallest angle in the triangle ≃ ....

(a) 57° 28' (b) 41° 12' (c) 28° 57' (d) 36° 52'

28 **In the opposite figure :**

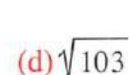
ABCD is a rectangle in which

DC = 6 cm. , BC = 8 cm.

and $E \in \overrightarrow{DB}$ where BE = 5 cm.

, then AE = ... cm.





(a) $\sqrt{93}$ (b) $\sqrt{97}$ (c) 10 (d) $\sqrt{103}$

Second Essay questions

Answer the following questions :

1 If $f(X) = 5^X$ **, find the solution set in $\mathbb{R}$ of the equation :** $f(X) + f(X - 1) = 150$

2 If $f : \mathbb{R} \longrightarrow \mathbb{R}$ where $f(X) = 4X - 2$, $h : [-2, 3] \longrightarrow \mathbb{R}$ where $h(X) = 4 - 3X$

graph the function $(f + h)$, determine its domain and range and discuss its monotony.

3 Find the value of a that makes the function f continuous at a where

$$f(X) = \begin{cases} 2 - X^2 & , \quad X \leq a \\ X & , \quad X > a \end{cases}$$

4 If $\lim\limits_{X \to 2} f(X) = 7$ where $f(X) = \begin{cases} X^2 + 3m & , \quad X < 2 \\ 5X + k & , \quad X > 2 \end{cases}$

, find the values of : m and k

Model 9

Interactive test 9



First Multiple choice questions

Choose the correct answer from the given ones :

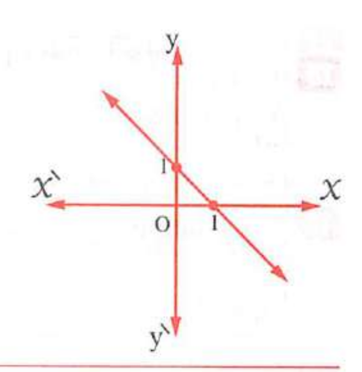
1 The solution set of the equation : $\log_{(X+3)} 125 = 3$ in $\mathbb{R}$ is ....

(a) $\{5\}$ (b) $\{3\}$ (c) $\varnothing$ (d) $\{2\}$

2 Δ LMN in which $m(\angle L) = 30°$, m = 9 cm. has two solutions when ℓ = ... cm.

(a) 6 (b) 10 (c) 11 (d) 2

3 The opposite figure represents the curve of the function f, then $\lim_{x \to 2} |f(x)| = \dots\dots$



(a) -1

(b) zero

(c) 1

(d) does not exist.

4 If $f : \mathbb{R} \longrightarrow \mathbb{R}$ where $f(x+1) - f(x) = x - 1$, then $f(10) - f(9) = \dots\dots$

(a) 1 (b) 9 (c) 8 (d) 18

5 $\lim_{x \to 0} \frac{2x}{\sin 3x} = \dots\dots$

(a) $\frac{2}{3}$ (b) $\frac{3}{2}$ (c) 6 (d) does not exist.

6 The image of the curve $y = |x| - 5$ by translation 3 units in the direction of $\overrightarrow{Ox}$ and 5 units in the direction of $\overrightarrow{Oy}$ is $\dots\dots$

(a) $y = |x-3| + 5$ (b) $y = |x-3|$ (c) $y = |x-3| - 10$ (d) $y = |x+3|$

7 $\lim_{x \to \infty} \frac{\sqrt{x+5} - \sqrt{5}}{\sqrt{x} - \sqrt{5}} = \dots\dots$

(a) 1 (b) -1 (c) ∞ (d) $-\infty$

8 If $f(x) = \sqrt[5]{x}$, then its inverse function is $f^{-1}(x) = \dots\dots$

(a) $\frac{1}{5} x^5$ (b) x^5 (c) $x^5 - 1$ (d) $5x^5$

9 In Δ ABC, c (a cos B + b cos A) = $\dots\dots$

(a) a^2 (b) b^2 (c) c^2 (d) $2c^2$

10 ABCD is a parallelogram in which : AB = 9 cm. , BC = 13 cm. , AC = 20 cm. , then the length of $\overline{BD} = \dots\dots$ cm.

(a) 5 (b) 10 (c) 205 (d) 4

11 If $f(x) = x - 1$, $g(x) = \sqrt{x}$, then the domain of $(g \circ f)$ is $\dots\dots$

(a) $\mathbb{R}$ (b) $]-\infty , 1[$ (c) $[1 , \infty[$ (d) $\mathbb{R} - \{1\}$

12 $\lim_{x \to 4} \frac{x^3\sqrt{x} - 128}{x - 4} = \dots\dots$

(a) 112 (b) 96 (c) 84 (d) 72

13 If $f(x) = \frac{\sqrt{x^2 - 2x + 1}}{x - 1}$, then the range of the function f is ....

(a) $\{1\}$ (b) $\mathbb{R}$ (c) $[-1, 1[$ (d) $\{-1, 1\}$

14 The solution set of the following equation in $\mathbb{R}$: $\log_2 x - \frac{3}{\log_2 x} = 2$ equals ....

(a) $\{-1, 3\}$ (b) $\{8, \frac{1}{2}\}$ (c) $\{8, 2\}$ (d) $\{\frac{1}{8}, 2\}$

15 $\lim\limits_{h \to 0} \frac{(x+h)^9 - x^9}{h} =$ ....

(a) x^9 (b) $9x^8$ (c) zero (d) does not exist.

16 If $a > b > c > 1$, then $\log_c \log_b \log_a a^{b^c} =$ ....

(a) zero (b) 1 (c) 2 (d) a b c

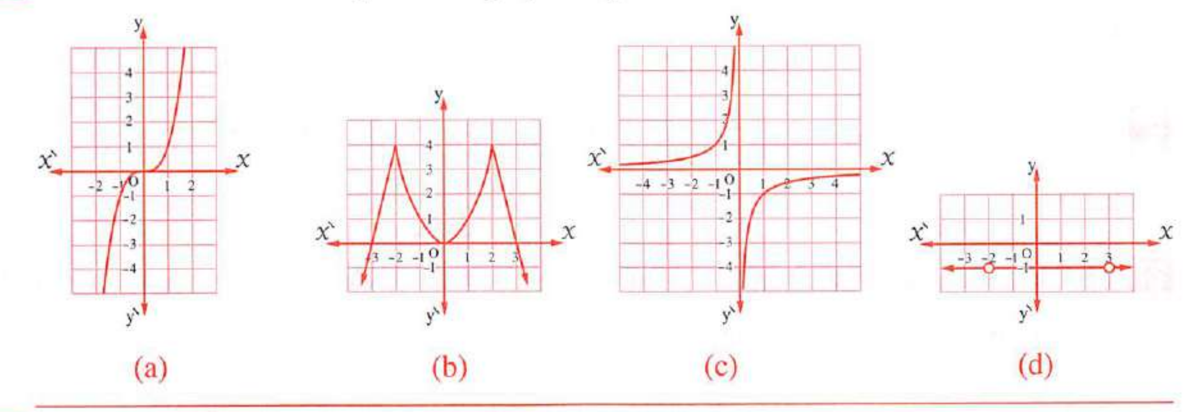
17 If ABC is a triangle in which a = 4 cm. , $b = 4\sqrt{3}$ cm. , c = 8 cm. , then sine of its smallest angle equals ....

(a) $\frac{1}{2}$ (b) $\frac{\sqrt{3}}{2}$ (c) 1 (d) zero

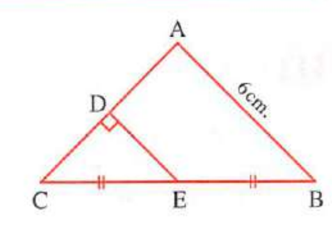
18 If $x = 5 + 2\sqrt{6}$, then $\log\left(\frac{1}{x} + x\right) =$ ....

(a) 1 (b) $5 - 2\sqrt{6}$ (c) 10 (d) $5 + 2\sqrt{6}$

19 Which of the functions represented graphically as follows is neither even nor odd ?



20 **In the opposite figure :**



If $\tan(\angle DEC) = \frac{3}{4}$, then the radius length of the circumcircle of Δ ABC = ... cm.

(a) 9 (b) 5.7

(c) $4\frac{3}{4}$ (d) 3.75

21 If $f(x) = x^2 + |x|$ where x is a real number , then the solution set in $\mathbb{R}$ of the equation : $f(x) = 2$ equals ....

(a) $\{-2\}$ (b) $\{-2, -1, 1\}$ (c) $\{1, -1\}$ (d) $\{1\}$

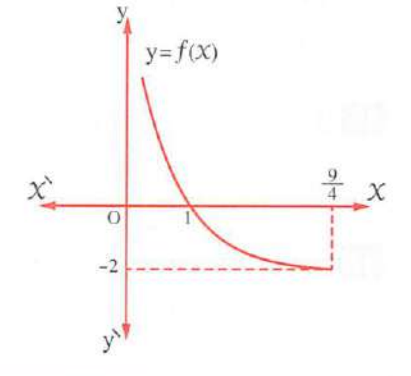
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22 $\lim\limits_{x \to 0} \sqrt{4 - x^2} =$ ....

(a) -1 (b) zero (c) 2 (d) does not exist.

---

23 If the opposite figure represents the curve of the function $f : f(x) = \log_a x$, then $\log_a \left(\frac{16}{81}\right) =$ ....



(a) -2 (b) 1

(c) 2 (d) 4

---

24 If the perimeter of Δ ABC = 33 cm. , sin A + sin C = $\frac{2}{3}$, sin B = $\frac{1}{4}$, then AC = ... cm.

(a) 6 (b) 9 (c) 12 (d) 15

---

25 The range of the function $f : f(x) = \frac{x+1}{x+2}$ equals ....

(a) $\mathbb{R}$ (b) $\mathbb{R} - \{-2\}$ (c) $\mathbb{R} - \{1\}$ (d) $\mathbb{R}^+$

---

26 If the function $f : f(x) = a x + b$, $f^{-1}(9) = 3$, $f^{-1}(5) = 2$, then a + b = ...

(a) -1 (b) 1 (c) 7 (d) -7

---

27 ABC is a triangle in which m ($\angle$ A) = 60° , b : c = 5 : 8 and the area of the circumcircle of the triangle ABC is 147 π cm^2 , then the perimeter of Δ ABC = ... cm.

(a) 21 (b) 34 (c) 54 (d) 60

---

28 In Δ XYZ , x = 30 cm. , y = 20 cm. , m ($\angle$ X) = 100° , then these conditions verify ....

(a) unique solution. (b) two solutions.

(c) three solutions. (d) no solution.

Second Essay questions

Answer the following questions :

1 If $f(X) = 3 + \sqrt{X - 1}$, find its inverse function.

2 If the function $f : f(X) = \begin{cases} X^2 + aX - 2 & , \quad X > 2 \\ 4 & , \quad X = 2 \\ 5a + bX & , \quad X < 2 \end{cases}$ is continuous at $X = 2$

, find the value of each of a , b

3 Graph the function $f : f(X) = \sqrt{X^2 - 4X + 4}$ and determine its range and discuss its monotony.

4 If $f(X) = \begin{cases} X|X| + 2 & , \quad X < 0 \\ \frac{|X|}{X} + 1 & , \quad X > 0 \end{cases}$, **find :** $\lim\limits_{X \to 0} f(X)$

Model 10

Interactive test 10



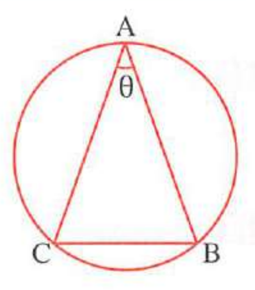
First Multiple choice questions

Choose the correct answer from the given ones :

1 log tan 1° + log tan 2° + log tan 3° + ⋯ + log tan 88° + log tan 89° = ...

(a) zero (b) 1 (c) 10 (d) 89

2 **In the opposite figure :**



ABC is a triangle inscribed in a circle whose radius length is 4 cm. , m (∠ BAC) = θ^{rad} , then $\lim\limits_{\theta^{rad} \to 0} \frac{BC}{\theta^{rad}} =$ ....

(a) 2 (b) 4

(c) 6 (d) 8

3 If the ratio among the measures of the angles of a triangle is 8 : 3 : 1 , then the ratio between the longest two sides in the triangle is ....

(a) $\sqrt{3} : 2$ (b) $\sqrt{6} : 2$ (c) 8 : 3 (d) 8 : 5

4 If $3^a = 4^b$, then $9^{\frac{a}{b}} + 16^{\frac{b}{a}} =$ ....

(a) 7 (b) 12 (c) 20 (d) 25

5 If $\lim\limits_{x \to \infty} \frac{3k|x|}{4x+3} = 6$, then k = ...

(a) 6 (b) $\frac{3}{4}$ (c) 8 (d) 3

6 If $f(x) = x^3$, then the image of the curve of f by reflection in x-axis and translation 3 units in the direction of $\overrightarrow{Ox}$ and two units in the direction of $\overrightarrow{Oy}$ is ....

(a) $-(x-3)^3-2$ (b) $-(x+3)^3+2$

(c) $-(x+3)^3-2$ (d) $-[(x+3)^3+2]$

7 If $f(x) = x+1$, $g(x) = \frac{x^2-1}{x-1}$, then $\lim\limits_{x \to 1} (g \circ f)(x) =$ ....

(a) 1 (b) 2 (c) -2 (d) 3

8 If $\log_2 3 \times \log_3 4 \times \log_4 5 \times \cdots \times \log_n (n+1) = 10$, then n = ...

(a) 9 (b) 10 (c) 11 (d) 1023

9 The domain of the function $f : f(x) = \sqrt{\sqrt{x^2}-1}$ is ....

(a) $]-1 , 1[$ (b) $[-1 , 1]$ (c) $\mathbb{R} -]-1 , 1[$ (d) $\mathbb{R} - \{-1 , 1\}$

10 In Δ ABC , m ($\angle$ A) = 112° , m ($\angle$ B) = 33° , c = 19 cm.

, then the diameter length of its circumcircle $\simeq$ .... cm.

(a) 16 (b) 17 (c) 32 (d) 33

11 If $2^x = 20$, $n < x < n+1$, n is an integer , then n = ...

(a) 4 (b) 5 (c) 6 (d) 10

12 In Δ XYZ , $y^2 + z^2 - x^2 = 2yz \times$ ....

(a) cos X (b) sin Z (c) cos Z (d) sin X

13 If the function $f : f(x) = \begin{cases} 3x-1 & , \quad x \neq 2 \\ 6 & , \quad x = 2 \end{cases}$, then $\lim\limits_{x \to 2} f(x) =$ ....

(a) -5 (b) 5 (c) 6 (d) does not exist.

14 If $f(x) = \log_2 (x+a)$ and $f^{-1}(2) = -3$, then a = ...

(a) -7 (b) 7 (c) 3 (d) 1

15 The exponential function whose base is a , is increasing if ....

(a) $a > 0$ (b) $a > 1$ (c) $0 < a < 1$ (d) $a = 1$

16 $\lim_{x \to \infty} (4 - 3x - x^3) =$ ....

(a) ∞ (b) does not exist. (c) -1 (d) $-\infty$

17 If f is an odd function , $a \in$ the domain of f , then $f(a) + f(-a) =$ ....

(a) $2f(a)$ (b) $2f(-a)$ (c) zero (d) $f(a)$

18 If f is an odd function , then $\frac{2f(3) + 7f(-3)}{10f(-3)} =$ ....

(a) 3 (b) -3 (c) $\frac{1}{2}$ (d) $-\frac{1}{2}$

19 If $f(x) = \sqrt{x+3}$, $g(x) = \sqrt{6-x}$, then $(f \circ g)(5) =$ ....

(a) undefined. (b) zero (c) 5 (d) 2

20 The range of the function $f : f(x) = \begin{cases} 2x+3 & , \quad x > 3 \\ 9 & , \quad x < 3 \end{cases}$ is ....

(a) $\{3\}$ (b) $\mathbb{R}$ (c) $]9 , \infty[$ (d) $[9 , \infty[$

21 In Δ ABC , if $m(\angle B) = 60°$, $m(\angle C) = 30°$, $c = 4$ cm. , then $b =$ .... cm.

(a) 4 (b) 8 (c) $2\sqrt{3}$ (d) $4\sqrt{3}$

22 If the area of Δ ABC is "x" and the radius length of its circumcircle is "r"
, then $\frac{4rx}{abc} =$ ....

(a) $\frac{a}{\sin A}$ (b) $\cos A$ (c) 1 (d) r

23 If $\lim_{x \to a^+} f(x) = \ell$, $\lim_{x \to a^-} f(x) = m$ and the function is continuous at $x = a$
, then $\ell^2 + m^2 - 2\ell m =$ ....

(a) 1 (b) 3 (c) zero (d) 6

24 If $a = \sin B$, $b = \sin C$, $c = \sin A$, then the circumference of the circumcircle of triangle ABC equals ....

(a) 1 (b) 2π (c) $\frac{1}{2}\pi$ (d) π

25 The solution set of the inequality : $\sqrt{9x^2-12x+4}+2|4-6x|\geq 20$ is ....

(a) $\mathbb{R}-\left]\frac{-2}{3},2\right[$ (b) $\left]\frac{-2}{3},2\right[$ (c) $\mathbb{R}-\left[\frac{-2}{3},2\right]$ (d) $\left[\frac{-2}{3},2\right]$

26 If $f(x)=(x+1)^3$, then $f^{-1}(x)=$ ....

(a) $(x+1)^3$ (b) $\sqrt[3]{x}-1$ (c) $\sqrt[3]{x}+1$ (d) x^3-1

27 In triangle ABC , which of the following statements is true ?

(a) $\sin A+\cos B=a+b$ (b) $a\sin B=b\sin A$

(c) $a=b\sin c$ (d) $\frac{a}{\sin A}=\frac{\sin B}{b}$

28 If ΔXYZ , $x=10$ cm. , $m(\angle Y)=50°$ has two solutions , then y could be .... cm.

(a) 6 (b) 11 (c) 7.66 (d) 8

Second Essay questions

Answer the following questions :

1 If the function $f: f(x)=\begin{cases} x^2+ax-2 & , x>2 \\ 4 & , x=2 \\ 5a+bx & , x<2 \end{cases}$ is continuous at $x=2$

, find the value of each of a , b

2 **Find algebraically in $\mathbb{R}$ the solution set of the equation :** $|x-3|=|9-2x|$

3 If $f(x)=7^{x+1}$

, **find the value of x which satisfies :** $f(2x-1)+f(x-2)=50$

4 If $\lim_{x\to a}|3x+2|=14$, **find the value of :** a



كيفية طباعة صفحات معينة من ملف معين



مثلا ازاى نطبع الصفحات من صفحة 4 الى صفحة 9

خطوة 1

خطوة 2
اختيار اسم الطابعة بتاعتك

خطوة 3
كتابة الصفحات المراد طباعتها
نكتب رقم 4 ثم نكتب الشرطة دي – ثم نكتب 9

خطوة 4
اختيار نوع الورق

خطوة 5
اختيار A4

خطوة 6